Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS.

VOLUME X.] NEW-YORK FEBRUARY 17, 1855. [NUMBER 23.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY
At 128 Fulton Street, N. Y. (Sun Buildings.)
BY MUNN & COMPANY.

O. D. MUNN, S. H. WALES, A. E. BEACH.

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How to Make the Gas Burn in Cold Weather.

Many persons, during the late excessive cold weather, experienced some difficulty in making the gas burn in their houses, caused by obstruction to the supply pipes and meters. Mr. Cresson, the engineer of the gas works, says the difficulty may be removed by pouring boiling water on a cloth spead over the meter and pipe that comes in through the front wall. This removes the frost in the meter and pipe, leaving a free course for the gas to flow.—[Philadelphia Ledger.

[The difficulties described by the *Ledger*, were experienced on quite an extended scale in this city, as well as Philadelphia, during the late severe frost. The method of remedying the evil suggested by Mr. Cresson, has been tried with success here.

Singular Optical Illusion.

The Paris correspondent of the *New York Times* states that a gentleman living in Brussels, somewhat troubled by spots in his eyes, rubbed them one night with a few drops of extract of belladona. In the morning the whole outer face of the world had changed. His newspaper, which had been placed by bed-side, was composed of type so small that he could hardly decypher it. He got up in a great fright, and looked after his clothing ; they were the garments of a child, but as his own limbs had diminished in proportion, he easily got into them. He found his wife and children at the table, the former a dwarf and the latter a row of dolls. He hurried off to his physician ; the horses he met looked liked dogs, and dogs like rats. Lotions were applied tc the victim's eyes, and the next day Brobdignag returned, bringing back the spots.

The Submarine Telegraph Across the Black Sea.

The London *Times* speaks of the departure of a steamer with the wire for a submarine cable, intended to be laid between Varna and Balaklava, a distance of 400 miles. Morse's system of telegraphing is to be used. By the end of February a direct telegraphic communication will be opened between the head-quarters of the allies in the Crimea and the two great western capitals, London and Paris ; for the French and English Governments have made such arrangements that the gentlemen who are proceeding out to the Black Sea confidently expect, by the time their vessel reaches the Euxine, the overland telegraph from Varna to Bucharest will be finished, thus completing the electric communication of the Crimea with England.

Galls from the Harness or Saddle.

Maj. Long, says the *American Farmer*, in his valuable account of his expedition to the Rocky Mountains, says, that his party found white lead moistened with milk to succeed better than anything else in preventing the bad effects of the galls on the horses' back in their march over the plains that border the mountains. Its effect in soothing the irritated and inflamed surface was admirable.

PATENT WINDOW WASHER.

The annexed figure is a perspective view of a method and apparatus for washing windows, for which a patent was granted to Geo. A. Meacham, of this city, on the 30th of last month.

This improvement enables any person to wash windows by ejecting a stream of water upon them, from the nozzle of a pipe, and by employing no other means to do so, than a pail, a post, and tube. It is applicable to the washing of windows inside of any room. E is an apron secured on the sole of the window to catch the water ; it has a pipe in its lower side, which allows the water to run into a pail, as shown, so that no water is spattered on the floor. A is a pail, and B is a portable stand post. It has pins secured on it as shown, and on its top there is a collar with a hole in it to guide and hold the pail in position. The pail has a shank or handle secured in its under side, which shank passes through the top collar on post B. The shank of the pail has also a metal ring secured on its lower end, which encircles the post, B, and is held at any point of elevation by the pins, as shown. C is a tube screwed into the bottom of the pail, and *p* is a faucet to open and close the tube ; D is a rose, or perforate nozzle—and a piece of sponge may be employed in the end of the tube, C.

By filling the pail, A, with water, and raising it to the hight shown—the top of the window—as represented, it is evident that when the faucet, *d*, is opened, the water will rise to the hight of the fountain head (the surface of the water in the pail, A,) and be ejected upon the window, as illustrated by this figure.

This is a simple apparatus for accomplishing the object specified ; it allows of windows in the interior of buildings being washed in a superior manner by a girl standing on the floor, without the necessity of getting upon a ladder or bench, as is now the practice to do so. Either a brush or sponge may be used on the end of the nozzle. All will understand the operation of this apparatus, and its utility and usefulness are apparent.

More information may be obtained from the inventor at 290 Broadway, room No. 13.

The large new frigate *Niagara* is now building at the government Navy Yard in Brooklyn. Messrs. Pease & Murphy, of this city, are building the engines, which will soon be ready, and do them credit.

American Linen Cloth and Thread.

We saw, last week, at the rooms of George F. Wilson, some specimens of flax in the various stages of manufacture, from the coarse raw material dressed without rotting, to the yarn fine enough to spin No. 100, and the woven cloth handsomely finished and beautifully bleached. Twine, thread, and other manufactures of flax were also exhibited. The various processes by which these results have been accomplished are most creditable to American ingenuity, and open new and important avenues to American enterprise. Flax is raised in large quantities for the seed ; it is easy of culture, and the raw material can be supplied in any quantity that may be desired. By the new processes of bleaching and spinning, the manufactured article can be afforded at prices altogether below those that it now commands. The times are not just now propitious for new enterprises, but as soon as money can be had for anything, we should think that these improvements would attract the attention of capitalists.—[Providence Journal, (R. I.)

[We believe this is the first fine linen cloth and thread which has been manufactured in our country. Linen twine and shoemakers' coarse thread have been extensively manufactured, but we have never seen a single yard of American linen on exhibition at any of our Fairs. Rhode Island is the mother of American cotton manufacturing by machinery, and it may yet prove to be the parent of the American linen manufacture, for we do not see anything to hinder our country from manufacturing linen as well as cotton cloth.

Late News from Europe.

The most recent news from Europe brings information of a complete disorganization of the coalition British Ministry. Lord John Russel had resigned because he could not continue in a Ministry that mismanaged the affairs in the Crimea so wretchedly. Of 54,000 British troops sent to the seat of war, there were now only 14,000 on duty, and only 2,000 of these were in good health. The London *Times* is savage upon the incapacity of the British aristocracy, and asserts that the interests of the country have been sacrificed to routine and aristocratic incompetency. It is perfectly reasonable to suppose that aristocrats, like the English nobility, cannot be educated to command and guide soldiers, or others. How can they project measures and carry them out for the welfare of soldiers during a campaign, they being brought up to have others care for and look after them. They are no better than grown up children in that forethought necessary to provide for themselves, and how can it be expected that they are qualified to take care of the soldiers under them? The only way to improve the Britsh government and army, is to throw open all offices to meritorious and capable men—plebians as well as patricians.

Garden Seats.

A correspondent of the *Gardener's Chronicle* says : "Every one finds great difficulty in keeping garden seats more than a year without constant painting. Gutta percha thinly laid on, and turned round the sides and nailed, will last forever."

Moore & Hascall's Patent in Congress.

On the 10th inst., the enacting clause of the Bill to extend Moore & Hascall's Reaper patent was ordered to be struck out by a vote of 96 to 34—thus defeating it completely.

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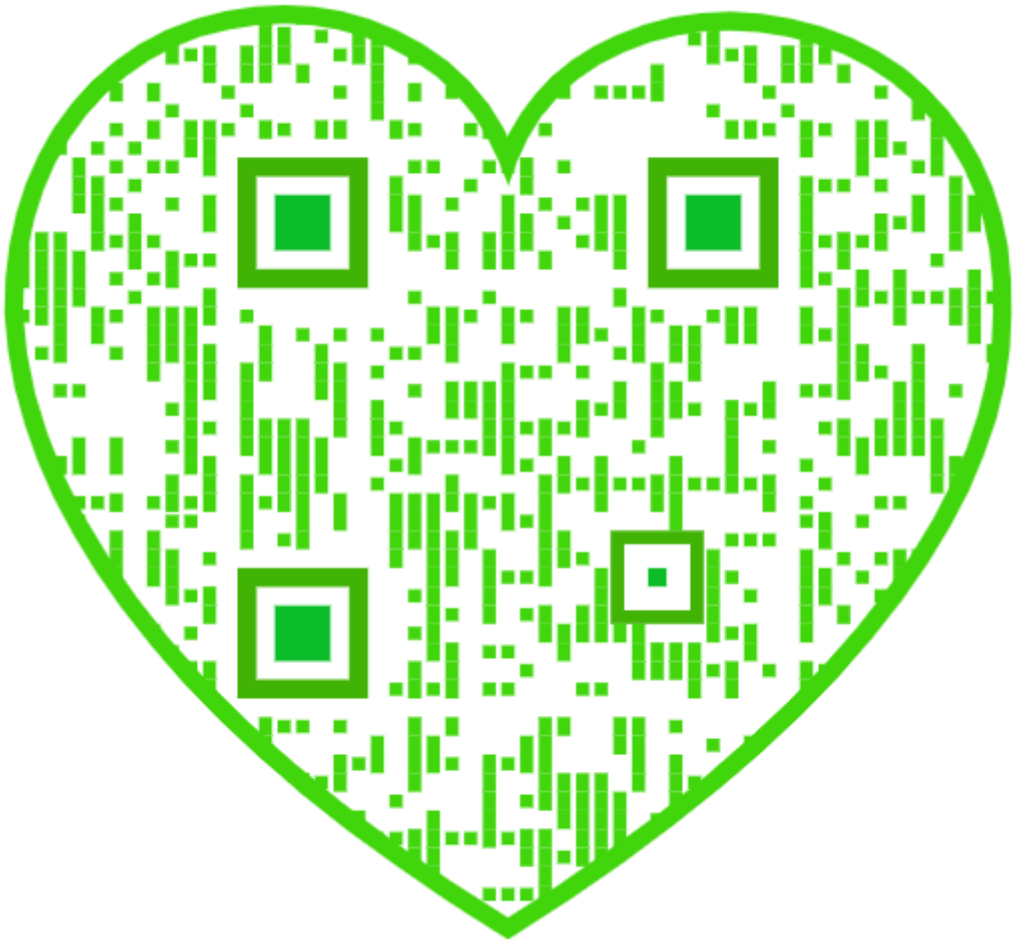

The Art of Dyeing—No. 8.

BLUE ON WOOL—All cloth should be made of dyed wool, for the color cannot penetrate so thoroughly into the minute cells of the wool when made into cloth as when in the wool state. The best cloths, therefore, are made of dyed wool, still there is a great deal of black cloth dyed in the piece. These pieces can easily be detected, as the makers of the genuine dyed-in-the-wool cloth weave a selvedge of a different color, while the cloth dyed in pieces cannot show this, and the only way that deception is practiced is by sewing on a selvedge of a different color. Persons purchasing black broadcloth would do well to remember this.

The dyeing of wool differs in no respect from woolen cloth, except in the apparatus; the stuffs employed are the same. The wool is dyed in nets, cloth is dyed by handling on a reel, and woolen yarn by turning it over on pins.

INDIGO BLUE—The common method of dyeing indigo blue on wool for domestic use, is by steeping finely ground indigo in urine, and keeping it at a temperature of about 62°, for four or five days. It then assumes a deep green color, and the wool may be well handled in it for about half an hour, when it will dye a color in depth according to the strength of the liquor. This is a simple and good method of dyeing indigo blue, but the odor is very unpleasant.

THE WARM VAT—It requires greater heat to dye wool than cotton or silk, the vat for dyeing wool therefore, has to be so made that it can be heated up. A perforated steam pipe some distance above the bottom of the vat, secured to its sides by brackets, so as to leave free room for raking, is the most convenient method of heating it. By this plan a wooden vat answers as well as an iron one, and the temperature of the liquor can be regulated with the utmost exactness. The indigo must be ground to an impalpable powder, or it will spot the goods, and also be a cause of loss. Take, for a small vat, six quarts of common flour bran and one pound of ground madder, and boil them in a kettle for two hours. In this liquor dissolve three pounds of potash, then take it off, allow it to settle, and pour the clear into the vat, which must now be filled with water at about 120°, to within six inches of the top. This is for a vat that will contain 250 gallons. Now introduce three pounds of finely ground Bengal indigo, and stir all up with a rake. The vat is now covered with a woolen cloth, and the temperature of the dye house should be maintained at about 62°. It is first left to rest for about ten hours, when it should be opened and raked well, and again covered up, and these operations continued every three hours—during the day time—for three days, when it will have assumed a deep green color, and is then fit for working. A net is let down into the vat, to keep any sediment from rising, and then the goods are introduced and cautiously handled until the depth of shade desired is obtained. The shade will not be deep for a vat of 250 gallons with only three pounds of indigo, but by using six pounds, and the same proportions of madder, bran, and potash, a strong vat will be the result. The heat of the vat for dyeing should be about 120° Fah. The mending and working out of an ash indigo vat, requires great care and attention.

The following is the French method of preparing and keeping the indigo vat for wool, usually termed "Homasel's method," and which, perhaps, has no superior:

"For a boiler of from thirty-six to fifty four-gallon buckets of water, employ four pounds of indigo of a fine copper color, two pounds of madder, eight pounds of pearl ash, or of potash, and one-sixth of a bushel of good bran.

Fill the boiler three-fourths full of soft water; put in four pounds of the alkali, a pound and a half of madder, and a quarter of a bushel of bran. Boil these together for at least four hours; this is absolutely necessary. When the liquor has boiled during that time, let it rest for twenty minutes, and strain it clear from the sediment.

While the bath or liquor is boiling, prepare the indigo, which it is absolutely essential should be bruised into a paste fine enough to pass through a fine sieve, which it must be made to do. The sediment that will not pass through must be ground over again. Put in the indigo, and take care that the boiler be not more than two-thirds full; nor should the heat be now permitted to exceed 45 degrees of Reaumur's thermometer, or 133 of Fah., to which degree it should be kept up; a few degrees below this will prevent its working well, and a few degrees above will scald it too much.

In twelve or fifteen hours the liquor will be green, when you must put in one pound of alkali; stir it well, and let it rest twelve hours, always keeping up the same degree of heat. Then put in the rest of the alkali, bran, and madder, and let the liquor boil for five minutes, but no more. Let the liquor now rest, until it be cool enough to empty into the vat; empty it therein, and stir it well; let it rest four hours, when it will have a fine green color and a pleasant smell.

When the wool is dyed, the liquor must be cooled to the degree in which the hand can be immersed without inconvenience; that is, rather under than above 133 degrees Fah. Should the vat after working become black, the indigo collects and is not diffused; if it becomes greasy, it leaves white spots on the cloth. In the latter case, put about a gallon and a half of bran in two or three bags, and throw them into the vat; when they have absorbed all the grease they will rise to the top of the vat, when they may be taken out and a refreshing of madder and alkali added, according to the quantity of indigo calculated to remain in the vat. Stir the liquor in the vat; let it rest four hours at the heat of 133° Fah. Stir it well again, and let it again rest four hours. If the vat be black, add a little alkali, and bring up the heat to 133° Fah., for twelve or fifteen hours, till it begins to come to, and then add a little madder and bran. The yarn or wool is handled in any of the known methods.

After having colored twenty pounds of wool, the vat may be slightly refreshed and stirred, and left to settle for four hours; but this refreshment need not be put in unless you observe the vat rather spent, and the green color turning blackish; too much refreshing with madder and bran will make the vat turn greasy.

A vat thus set, will dye thirty pounds of wool a royal blue, for each pound of indigo, and also thirty other pounds a lighter blue, and even give a light blue ground to other parcels intended for greens and browns.—This vat ought to be worked out till it is spent and clear, that there may be no need of the trouble and expense of reheating; and the quantity of indigo should be previously calculated to answer the quantity of blues and greens you contemplate to dye in it. This vat is superior in color, when the indigo is good, to the pastel or woad vat; but when cloth is to be dyed in it, instead of wool, the dyers proceed thus:

For a vat of a hundred buckets of water they employ but four pounds of indigo, which is treated as above. In another small boiler, holding ten or a dozen buckets of water, they set another vat, wherein they employ from ten to twelve pounds of indigo in perfect solution, that is, using the proportions of madder and bran necessary with the alkali to dissolve the indigo. By taking a bucket full or two out of this small vat and pouring it into the large one, the latter is conveniently refreshed, and kept up of any desired strength. Before the cloth is dyed, it is exposed on the grass to bleach, and then fulled, and the large vat is kept rather weak than strong. The bleaching and milling contributes much to the brilliancy of color.

The Snail Trade.

Among the list of articles exported from Switzerland, appears the item "snails," of which 925 quintals were sold for foreign consumption during the months of October and November last.

[Who uses them, and what are they used for.

Remarkable Properties of Sugar Cane Juice.

An article on the cure of consumptive and bronchial diseases, by Dr. Cartwright, of New Orleans, has been published in the Boston *Medical and Surgical Journal*, in which he describes cures effected on persons afflicted with consumption and bronchitis, by inhaling the vapor arising from cane juice, in the act of boiling. The information which he presents is both curious and useful. He says:—

"The alcoholic liquor known as rum, is obtained from sugar alone; the ferment called *dunder*, being an aromatic substance obtained from the skimmings of boiling cane-juice; which is necessary to assist in the decomposition of the sugar in its metamorphosis into rum.

Arequin, a French chemist, of New Orleans, whom Liebig, Dumas, and Gerhardt quote in their works as the very highest authority in the analysis of cane-juice, has discovered a peculiar principle in that liquor, which he calls *cerosie*. He says it is an unique natural alcohol, and presents the only instance known in nature of an alcoholic substance being produced without artificial agency. The new and wonderful science of optical chemistry proves that one of the chief constituents of the liquor in the clarifiers, from which the fragrant saccharine vapor arises, has the power to rotate the plane of polarization of polarized light, 100° to the right.

According to experiments of Carminati, the essential salt of cane-juice destroys such cold-blooded animals as toads and lizards, whether applied externally or given internally. There are also many conflicting facts in regard to the virtues of sugar—some proving that it breeds worms, causes scurvey, and injures the teeth; others, that it destroys worms, cures scurvy, and whitens the teeth. These facts are reconciled by the discovery of the two kinds of sugar—the *dextrogyrate* and the *lævogyrate*. I took an alligator to the chemical laboratory, requesting Mr. Riddell to try if the respiration of carbonic acid gas would kill it. After trying gas upon it for a good part of the day, it was brought back as lively and vigorous as ever. It was thought that owing to the size of the animal, the vessel it was put into might have contained a small portion of atmospheric air. I then gave it some pure dextrogyrate sugar from the plantation of P. M. Latice, Esq., being some of the same parcel which was made by first process, and rotated 100° to the right. Also a solution of it was smeared over its body. This was in the evening. The next morning the alligator was found perfectly dead."

About this time Prof. Riddell was busily engaged in looking into a new world, invisible to the naked eye, through his powerful microscope. The sediment taken from the gutters was found to be alive with rotifera and various other hideous-looking animalculæ. The most numerous among them was a species of the *Euchlanis Leucophreys patula*. They briskly moved through an olgoid substance, called by the Professor *ocillaria*. He fed them with various matters, such as carmine, which they devoured with the same rapacity that hungry, ravenous beasts, in the visible world, devour their food. He fed them on human blood, which they gobbled down with a keen relish. At length I handed to the Professor a stock of mature cane, just cut from the field of a sugar plantation. He squeezed some juice out of it, and put a speck into the nidus of these ravenous animals. It killed the whole of them as quick as lightning. Young Riddell, a smart boy about 12 years of age suggested to his father, the Professor, to try to bring them to life by the same means that he had brought others to life killed with chloroform. He tried, but could not bring them to life. They were dead. Among them was a nondescript animalculæ resembling a tape-worm. It did not die instantly as the others did, but all its joints came apart, and in a few seconds every joint was dead."

These results appear more like magic than sober facts. From witnessing such remarkable properties in sugar cane juice, Dr. Cartwright anticipated remarkable effects from its application to medicine. He was filled with enthusiasm, and at once proceeded to the house of a patient—a young Frenchman in New Orleans—who appeared to be dying with the consumption. He had him conveyed to a sugar house in a very short time afterwards, where he soon recovered by inhaling the vapor of boiling cane juice. This person is Dr. Chapellier, whom his friends had given up as one ready to drop into the grave. It has long been observed by overseers of sugar plantations that weakly and sickly persons soon get robust and strong when set to skimming the pans during the boiling of cane juice; facts are overwhelming on this point. From Dr. Cartwright's knowledge of this, and the peculiar effects of cane juice in destroying cold-blooded animals, he recommends the inhaling of cane juice vapor as a cure for consumption in its early stages. His own experience seems to be conclusive on this point. The fragrant cane juice is perfectly respirable, and penetrates into the smallest bronchial tubes, and produces beneficial effects.

"The essential salt of cane juice," he says, "is technically called *dextrogyrate* sugar, because its solution rotates the plain of polarization of polarized light to the right. No other saccharine matter than dextrogyrate, or vital sugar, is contained in the cane plant. After the canes are cut, unless the weather be extremely cold, whether the juice be expressed or not, chemical changes begin almost immediately to occur, as in the blood and flesh of slaughtered animals. Instead of putrefaction, as in flesh and blood, fermentation takes place, and the dextrogyrate begins to be converted into *lævogyrate* sugar, which rotates to the left. The refiner's art can convert it into *glucose*, and make it assume the crystalline form, looking pretty and white, and rotating to the right again; but no art can ever reconvert it into a substance possessing its original properties—its lost aroma cannot be restored. That aroma is very volatile; it is as effectually destroyed by double refining, as the aroma of wine by its distillation into alcohol. Loaf sugar, however, when made by what is called the 'first process,' on the same day the canes are cut, preserves much of its aromatic odor. It is the volatile aroma in the cane juice, which, perhaps, imparts some specific virtue to the vapor that hangs, like a cloud of incense, over the boiling-kettles of a sugar house. Although something is known in regard to it, there is yet much to learn."

The extracts which we have given from the article of Dr. Cartwright, deserve a wide circulation. It appears there are two kinds of sugar, of very different properties, both made from the cane, the best being made from the unchanged juice. It therefore appears to us to be a question which should deeply interest sugar planters, namely, to prevent the juice undergoing any chemical change before it is boiled and made into sugar.

A New Life Preserver.

The Toledo (Ohio) *Blade* says: Capt. Isaac T. Phratt, of the *Northern Indiana*, has invented a new life preserver, which promises to be very valuable. The idea is, to attach to the panel of every door on board of a vessel or a steamboat an india rubber sheet, which, in a collapsed condition, lies flat upon the surface. Usually there will be four panels to a door, and when the sacks are inflated it is designed that the door shall be capable of saving one or more individuals. Small cords are to be attached to each door, and staples are driven in each, so that two or more doors can be promptly lashed together.

More Gold.

The steamship *North Star* arrived at this port from Aspinwall, on Thursday evening last week, with no less than $1,239,000 in gold. This shows that the placers are still yielding large quantities of this precious metal. A great number of machines are now at work in California crushing the ore and operating upon a large scale. Improved methods of crushing the quartz and extracting the gold are now reaping their golden harvests. Hand labor by simple pan washing will soon be at an end, but the fields for machine labor have no limits.

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(For the Scientific American.)

Music and the Pianoforte.

Music is a natural, inherent gift of man, yet not to man alone has the power to make melody been given, but also to many of the lower order of beings in the animal kingdom. Music is not only a natural faculty produced by the animal organs, but it is also artificially produced by human invention.

In all civilized nations has music been cultivated as one of the fine arts, and even among savages has it received some attention. Any country may well be judged of its advancement in civilization by the musical progress and education of its people. Inspired by the love of melody, man has made and used various instruments for the production of music, from the eighth generation to the present time.

The harp may be truly called the father of musical instruments. It is the most prominent and often spoken of in sacred history, and though of ancient origin, it is also an instrument of modern and present use, unequalled for purity and sweetness of tone by any others, but limited in its power and compass. The harp (like many an ancient father unsurpassed by intrinsic worth) has been outdone and rivalled by the improvements of its offsprings, and their wider and greater range of usefulness.

Among such instruments of more modern date is the Pianoforte, not inappropriately styled "the prince of instruments" of the present day. The pianoforte cannot in truth be called the invention of any one man, but a series of improvements upon improvements for the last century and a half. It was unquestionably derived from the harp, and is a mechanical device for producing and checking the vibration of its strings, which are based upon the same natural and fundamental law of geometrical progression (in their vibrations) as its predecessor.

The first instrument with horizontal strings was always called a psalterion or tympanum, and more recently a dulcimer. These instruments consisted either of metallic strings, or like those of the harp, made from the ligaments of animal intestines, drawn across a wooden box, and tuned like the harp to the various notes of the scale—but instead of being snapped with the fingers they were struck with small hammers covered with cloth or leather, and held in the hand of the performer.

The first improvement upon this was the addition of keys, or what is usually termed the key-board, with pieces of upright wire set in the back part of them, to strike the strings when the front part of the key was pressed down. This instrument was called a clavichord.

The second improvement consisted of the addition of a quill to the jack (or upright piece now made of wood) which caught the string in its upward motion, snapped off, and left the string free to vibrate whilst the key was held down. This instrument was called a spinet.

The third improvement was the addition of another string to each note, which history reports to have been an Italian production, in the year 1711, and was named the harpsichord or horizontal harp.

The instruments already described were rude and unscientific works, but, nevertheless, they were the germ of the present pianoforte —thus far the improvements had been almost wholly upon the action, or the mechanism which forms the connection between the key and the vibration of the strings.

The next, and one of the greatest improvements, was the introduction of the lever hammer into the action; this, together with the addition of the dampers, so far advanced the instrument that the performer could play soft or loud at pleasure; it then received the very appropriate name of pianoforte, a compound of two Italian words. The author of this last improvement is supposed to have been a German, by the name of Gottfried Silberman, of Freyburg, who manufactured instruments of this kind in the year 1747. It is, however, claimed by the French and English as well as the Germans.

The next important improvement is credited to Christopher Gottleib Schræter, of Hohenstein, on the borders of Bohemia, in the year 1768. By this improvement the action was so far perfected that the performer could execute much more rapid and difficult music than could be played upon any of the previous made instruments.

The earliest record of the production of pianofortes in England was in the year 1767, by Messrs. Broadwood & Sons, then the principal makers of harpsichords in London, and afterwards the best pianoforte makers in that great metropolis. The name of that firm has descended from father to son, grandson, and greatgrandson, and with it the fame and reputation so well earned by the sires, is justly credited to the Messrs. Broadwood & Sons of the present day, as being the best makers of that instrument in England.

Sebastian Erard, of Paris, made many valuable improvements in the pianoforte. He was the founder of two very large establishments for the manufacture of musical instruments of various kinds; one in Paris and the other in London. Pierre Erard, the present proprietor, was his nephew, heir, and successor, and is now making upwards of one hundred pianos per week, besides harps, guitars, and other instruments in proportion.

The French pianos are the neatest and best finished internally (and some of them externally) of any in the world, but their tone is not generally liked in the United States as well as those that are made here, and their touch, like all foreign pianos, is very heavy, which prevents their general use in this country. The Germans, Swiss, and Italians have also made great progress in the manufacture and use of the pianoforte. Being so many nations of musicians, they have not been slow to learn what instrument was best adapted to their wants.

Improvement after improvement has followed in succession, until the once rude dulcimer has been transformed into the most perfect instrument in existence. Under the hand of an experienced pianist it is capable of yielding the greatest variety, as well as the most difficult music ever written. Upon it the performer can mechanically express the very soul of music, the thoughts and feelings of its author; it is in fact an artificial mode of producing the most brilliant and beautiful pieces ever composed.

At the time of the great Exhibition in London, in 1851, it was estimated that there were made in that city some 450 pianos per week, or upwards of 23,000 per annum—and in all other parts of Great Britain 54,740, making a total of 77,740 pianofortes in one year—classed and valued as follows;

Grands,	1,300, at £110 each,		143,000
Squares,	1,040, "	60 "	62,400
Uprights,	75,400, "	35 "	2,639,000
Whole No.	77,740, valued at		£2,844,400

The number made in France is estimated at one-third of that of Great Britain, and all others in Europe at two-thirds—making in all 155,480 pianofortes manufactured in Europe in one year, furnishing employment for not less than 25,000 workmen.

There were exhibited in 1851, by the Messrs. Collards, good pianos in plain cases as low as £30, and from that sum upwards as high as 500 guineas, and others by the Messrs. Broadwood & Sons at a still higher price.

The manufacture of pianofortes in the United States has increased very rapidly within the last twenty years. Previous to that time the most of the pianos used in this country were imported from Europe, but there are now made upwards of 400 pianos per week, or a total of about 21,000 per annum, furnishing employment (on the whole work from the rough materials to the completion) for at least 3500 worknen. The business has caused the establishment of several machine shops with very expensive machinery for the manufacture of what is termed pianoforte trimmings, or those parts of the instrument that are made of iron, brass, and steel; there being in each (of the Boston made pianos) about 100 lbs. of those metals.

The other parts of the work are divdedi into many separate trades, such as the bottom, skeleton, leg, top, desk, pedal, sounding-board, harp and action makers; carver, varnisher, stringer, finisher, trimmer, regulator, and tuner, besides much that is done by machinery, such as sawing, turning, jig and fret sawing.

The materials for the manufacture of pianos have decreased in supply, and increased in value, some of them to near double their former cost a few years since. The principal woods used are ash, oak, maple, spruce, pine, chestnut, cherry, walnut, rosewood, and mahogany, all of which require a long time of natural and artificial seasoning before they are fit for use; averaging some two or three years after they are sawed. The average time for the making of a piano, from its commencement to completion, in the large manufactories, is about four months.

To improve in workmanship, tone, and quality of the instrument, should be the constant desire of every manufacturer, and has been of all those who had ambition and perseverance enough for success. The tone of a vibrating string takes its pitch from its number or speed of the vibrations; the greater the velocity with which it cuts the air the higher in the scale will be the note. The number of vibrations are governed by the length and size of the string, the larger and longer the string the lower or deeper will be its tone; the longer the string the further apart are its nodal and vibrating points—consequently its vibrations will be less in number.

The quality of the tone is principally dependent upon two causes, entirely independent of each others. First, the application of the power which produces the vibrations (which is the blow given by the hammer.) If that blow be not given with sufficient force, or the hammer properly covered, the tone will be faulty. The second, and perhaps that which is the greatest cause, and most inseparably connected with the good or bad tone of the instrument, is the sounding-board; its stock, formation, and connection with the strings are its ruling powers of the tone.

The successful manufacturing of pianofortes is perhaps the most difficult and uncertain business to establish of any in this country. It requires not only a thorough practical knowledge of mechanics, but years of patience and perseverance with a large capital and good reputation. The largest establishment in this country is now making from 25 to 30 pianos per week, but it has taken upwards of thirty years of constant toil to reach that number, and the progress of the other manufacturers has been in about the same proportion, with one exception, where upwards of twenty pianos per week has been reached in less than nine years.

Such has been the progress of musical taste in this country, that the parlor is now only half furnished without a pianoforte, and though a luxury, and sometimes a costly one, yet it has a moral and a social influence that is beyond all comparison with dollars and cents. It is the center around which many a family nightly gather to enjoy their fourth and most luxurious meal of the day. A musical festival satiating to repletion their appetites for amusement, thereby restraining the wayward from seeking elsewhere pernicious and injurious enjoyment. B.

Boston.

Attraction—Gravitation.

MESSRS. EDITORS—Your correspondent, J. B. Conger, says "the idea of subverting the force of gravity is manifestly absurd. The least change in the action of gravity would throw the whole system into confusion. The regulation of the world is not based on so precarious a foundation." Unfortunately, however, he forgot that that "least change" must be universal before it can "throw the whole system into confusion," and I must confess myself so obtuse as to be unable to discern how the counteraction of 500 lbs. force of gravity on the earth would in the slightest manner discommode the Saturnites or Neptuneites, or even the man in the moon.

Let us now look at the subject of this suspension of gravitation for a moment. Attraction seems to be divided into the following classes: gravitation, cohesive attraction, affinity, magnetism, and capilliary attraction. Now, the second quality may be suspended by heat, in metals, or destroyed, in combustibles. Affinity is regulated by heat, in forming compounds. Magnetism may be suspended, destroyed, or reversed, by heat. Capillary attraction may be reversed by heat. And will Mr. G. inform me why we should not reason from analogy and conclude that gravitation is subject to the same influence? I believe it will be done. ALFRED PARKES.

[We have received so many communications on this subject, that we deem it prudent to publish no more on it, for the present at least. J. B. Conger is perfectly correct in his conclusion, respecting the simple suspension of gravity, in the manner referred to by Septimus Piesse, our London contributor; he has laid down facts as the basis of his arguments which cannot be overthrown by inferences.

Alcohol.

Alcohol is that combustible fluid which rises by the distillation of the juices of sweet fruits; from the infusion of malted barley or other grain; the solutions of sugar, honey and other substances that are capable of being converted into sugar after they have undergone that spontaneous change which is commonly known as fermentation—the vinous fermentation. The word alcohol is of Arabic or Hebrew origin, and signifies subtle or attenuated; but although it has for many ages been used to designate the material in question, it does not appear to have become popular; "spirits of wine," or "spirits," being the general interpretation of alcohol. As alcohol is well known to be derived from sugar, malt, and grapes, it is generally though erroneously believed that these substances contain it. By the hand of Power "a Greek Slave" can be produced from a solid mass of marble chained to a pedestal. No one will believe that the beautiful form pre-existed in the marble, and that Power merely removed the stone veil that enclosed it! In like manner, when a chemist manipulates sugar, barley, or grapes for the purpose of making alcohol, he does not separate it as a material pre-existing in the substances operated on, but merely uses the ingredients contained therein to create alcohol. It is an ascertained fact that alcohol can only be made from sugar, although at first sight it appears to be made from a variety of things, such as potatoes, treacle, &c. When it is known that any materials that contain starch can be converted into sugar, the mystery of making alcohol from potatoes becomes solved. Moreover, when starch is manipulated in another way, chemists can produce from it vinegar, sugar, alcohol, water, carbonic acid, oxalicacid, carbonic oxyd gas, lactic acid, and many other substances; but it must not be supposed that these materials have any pre-existence in starch—no, they have been created from the elements composing starch, but not from that substance itself. The starch is broken up, and its elements are re-arranged into new forms. When alcohol is made from barley we merely complete a change which nature had begun. Barley contains starch. When barley is malted the starch becomes sugar: this we extract by the use of water, and call it wort. Fermentation is now set up, and the sugar is changed into "spirit." How quickly this can be turned into acetic acid—that is, vinegar—is well known to all beer drinkers.

SEPTIMUS PIESSE.

Foot Rot in Sheep.

The *Country Gentleman* states that the following remedy for the foot rot in sheep, has been used with great success by H. Howland, of Aurora, Cayuga Co., for the last thirty years:—

"Mix flour of sulphur with the salt given to the sheep, in a proportion just sufficient to discolor perceptibly the salt, or about one-eighth part. Sulphur may be had at a wholesale price at a cost of not over two cents. Where local applications are necessary, we should much prefer a solution of chloride of lime, to any other application.

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New Inventions.

Preventing Cars Running off the Track.

In our list of claims this week, the patent granted to G. P. Ketchum, of Bedford, Ind., embraces peculiar features to prevent the cars running off the track in consequence of passing over obstacles thereon. Upon one of the axles of each truck, a pair of arms are placed loosely, and the arms of each pair of trucks are connected by a longitudinal rod, and so arranged that when either pair of wheels are thrown off the rails, the ends of the arms mentioned will come in contact with the rails and serve as guides.

Improvement in Flour Bolting.

The patent just granted to F. B. Hunt, and Elias Nordyke, of Richmond, Ind., whose claims are published in this week's list, embraces the expanding and contracting of the rotating brushes which act against the inner surface of the wire cloth of the bolt, and force the flour through the meshes, these brushes bearing with a greater or less pressure against the wire cloth, according as they are adjusted. Adjustable spouts are also employed and so arranged, that the bolted flour, may be separated, at various points underneath the bolt according to the nature of the grain that is being ground.

Grain Separator and Smut Machine.

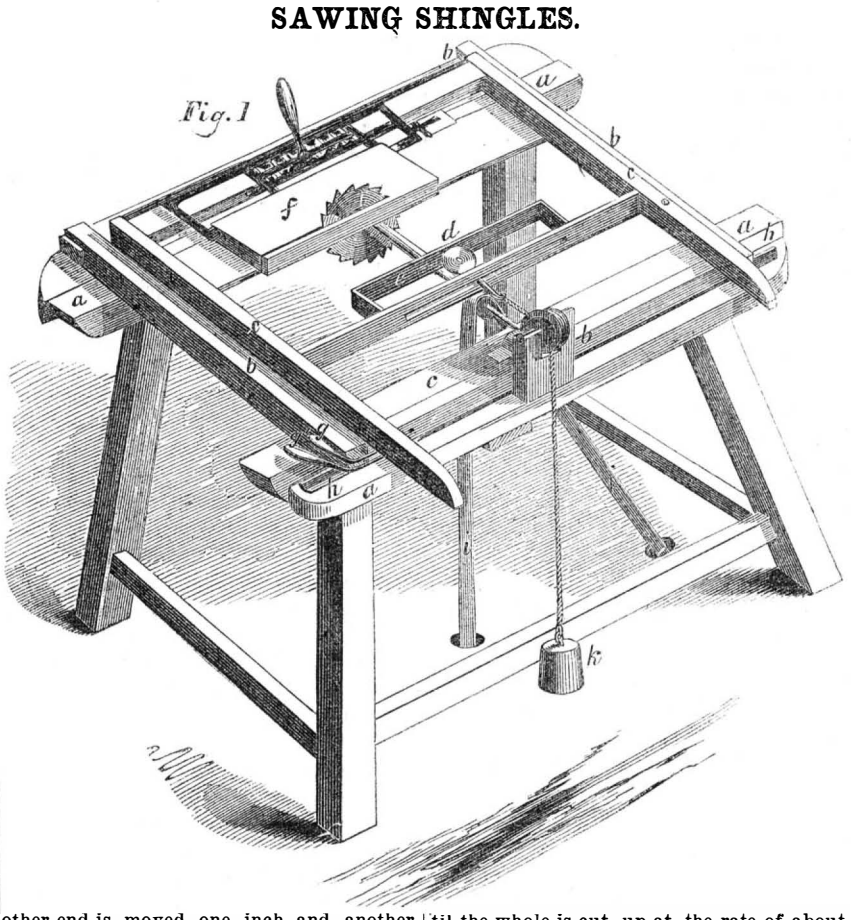
The nature of the improvement on separators and smut machines, for which a patent has just been granted to John Bean and B. Wright, of Hudson, Mich., as set forth in the claims of this week, consists in combining the grain separator with the smut apparatus in such a manner that the air in passing to the fan of the separator goes through the smut screen, and materially assists in cleansing the grain more perfectly than by other machines.

Shingle Machine.

The annexed engraving is a perspective view of a shingle machine, for which a patent was granted to Charles J. Conrod, of Lower Augusta Township, Pa., on the 19th of last Sept.

The nature of the improvement consists in a new mode and combination of parts, whereby the thickness of the shingles to be sawed is gauged with great facility, and at either end, according to the thickness and taper required. *a* is a strong table-shaped frame, which supports a circular saw, *i*, fixed upon an arbor having suitable bearings. Upon the two longest rails or timbers of the frame are secured two iron plates, *h*, with flanges or ways upon which the carriage frame, *b*, moves, aided by grooved castors or friction wheels. The frame, *b*. is furnished with an iron plate on each of the shorter or cross bars, one of which has notches in its upper edge one inch apart, and the other notches, alternately, three-fourths and one quarter of an inch apart. On the carriage frame, *b*, and within its shorter beam there is placed the register carriage or frame, *c*, it has a pin or single tooth projecting from each of its under sides, which rest in the notches of iron plate named, and is provided with dogs to grasp and hold the block or shingle bolt, *f*, about the center of the frame; *c*, extends a slotted piece, carrying ways upon its inner sides, upon which the double grooved pulleys, *d*, traverse freely, having a hooked projection from their axis, projecting through the slot, to which is fastened a cord passing over a pulley journalled in a projection from the frame, *a*, and sustains a counterbalance weight, *k*, the function of which is to draw the frome, *c*, forward when it is elevated and disengaged from the notches in the plates, or either of them, by the action of the crooked lever, *g g'*. When the machine is to be used, the sawyer takes his station with his left hand towards the shingle bolt, *f*, and brings the bolt up to the saw, he strikes or presses the shorter lever, *g*, which, by lifting the frame, *c*, allows the weight, *k*, to move the end of the frame, *c*, which is nearest to the sawyer, three-fourths of an inch; the power being applied to the circular saw, *i*, in any convenient manner, the carriage frame, *b*, is pushed forward by the left hand, and a shingle is cut; it is then drawn back, and by striking the short lever nearest the end, is moved one-fourth of an inch, and by striking the long lever, *g'*, the

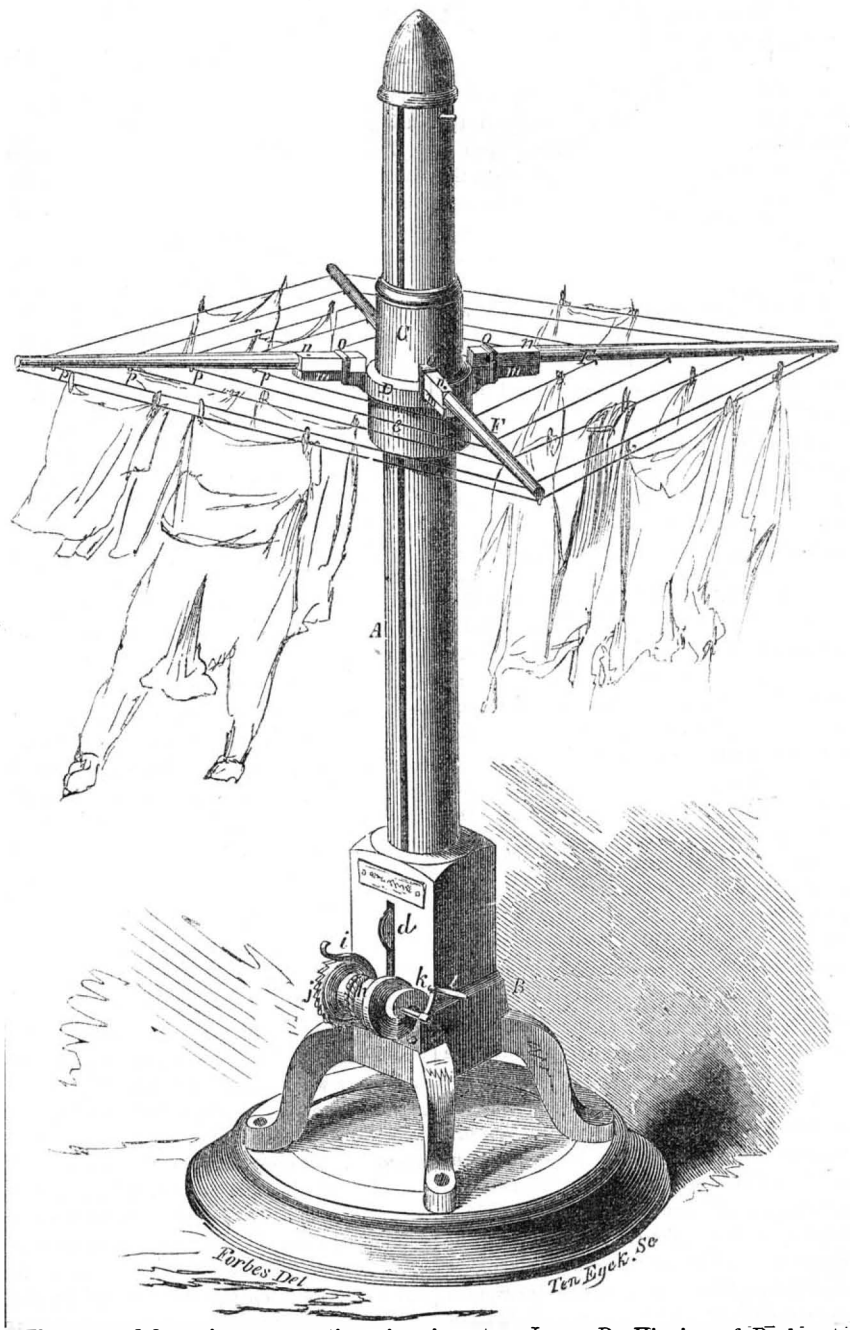
SAWING SHINGLES.



other end is moved one inch, and another shingle is cut, which will be of the same taper and thickness as the first one. The operations, as described, are then repeated until the whole is cut up at the rate of about twelve shingles per minute.

More information may be obtained by letter addressed to Mr. Conrod.

CLOTHES DRYING MACHINE.



The annexed figure is a perspective view of a clothes drying machine, for which the inventor, James R. Higgins, of Rockport, Ind., has taken measures to secure a patent.

A is a hollow wooden post with a vertical slot cut in it. It is secured to a proper base, B; C is a band, and D is a collar placed around it, and resting upon a flanch, *e*; *m m* are four radial projections on the collar, to which arms, F F are secured by screws, *n n*, and clamps, *o*; hooks, *p p* are secured to the undersides of the arms, and cords or lines are strung around, as shown, upon which to hang the clothes. On the base, B, in the slot of the post, there is a pulley, *d*, over which, from the drum or windlass, *k*, there passes a cord, *h*, up in the post, and over a small pulley (not shown) at the top. This cord is attached by one end to a hook in the inside of a flanch, *e*, and a pawl, *i*, holds the windlass from turning. By turning the crank, *l*, of the small windlass, the flanch and collar, C, with the clothes, is elevated to any point on the post, and the pawl, *i*, by catching into the ratchet teeth, *j*, will retain the clothes driers, which may be termed "a reel," at any point, to which it is raised. This clothes reel, be it observed, is capable of turning round by the collar, C, being adapted to rotate on its flange. By taking out the ratchet, *i*, from its teeth, *j*, the clothes reel will descend by its own gravity.

The construction and operation of this clothes drying machine is so simple that all will understand it from this illustration and description, and more information may be obtained about it by letter addressed to Mr. Higgins.

New Portable Stove.

At the Society of Arts, on Wednesday, a portable stove for heating and cooking, called the Crimean Army Stove, constructed by Price's Patent Candle Company, was exhibited in full action. It is made of thin wrought iron, without any flue, may be used on any table and in any room, and was designed by the inventors for the use of the army, for whom it seems peculiarly suited. It is simple and compact in its arrangement. The fuel employed is cocoa-nut stearine, in cakes, burnt by means of six wicks introduced into each cake, the cake fitting into a tin dish, made exactly to contain it. No smoke is produced, and the stove is capable of boiling, baking, and broiling, and the whole is comprised in a cube of about 16 inches. The cost of fuel burnt is at the rate of 1d. per hour, a cake lasting eight hours. Our gallant army in the Crimea have suffered bitterly from the scarcity of fuel, as well as the difficulty of cooking their food, and it was to remedy these distressing evils that this contrivance was devised by its inventors. We understand that it was long since approved of by the government authorities, to whom it was referred for examination; but, although it can be supplied at 17s. per stove, our paralyzing and deplorable system of routine has hitherto prevented the necessary supply being forwarded to the Crimea. The company have themselves sent out 100 of the stoves, while the apathy and incapacity of the official department which assumes to manage the war, is, in addition to many other causes of reproach, exemplified in their not having as yet followed that spirited example.—[London Mining Journal.

Opening of the Panama Railroad.

The Panama Railroad was completed on the 8th of last month, and the first train passed over it on that day. It caused great excitement among the native population, very few of them having ever seen a locomotive. This railroad connects the Atlantic with the Pacific Ocean. Hereafter those who go from this city to the Pacific regions, need not fear the loss of health by fever, as formerly, when crossing the Isthmus. The time in crossing will only be about four hours, in comfortable cars, perfectly secluded from the weather. The Pacific Mail Steamship Company intend keeping one of their steamers ready at Panama, waiting for passengers from the Atlantic States, so that they will not be required to wait, but proceed at once from the railroad to California.

The English papers state that a very large dark spot can be seen in London near the center of the sun's disk.

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Scientific American.

NEW YORK, FRBRUARY 17, 1855.

Proposed Alterations in the Patent Laws.

Strenuous efforts are now being made at Washington to procure the immediate passage of a bill providing for an extensive alteration of the present Patent Laws. We trust that our Senators and Representatives will be careful how they vote on this subject; especially do we hope that they will not allow themselves to be forced into any hurried legislation respecting the same. The matter is one of vital importance, not only to inventors individually, but to the whole country at large, and it should, therefore, receive the most deliberate and studious examination, as well as the most thorough and extended legislative discussion. We are aware that less general knowledge prevails among our legislators respecting the wants of the people upon this matter than upon almost any other which comes before Congress. But it seems to us that from this very reason they should delay action in the premises until they have had time to inform themselves properly respecting the whole subject. Some amendment of the present laws no doubt are demanded in order to increase the revenues of the Patent Office, which, at present are not sufficient to meet its expenses. But the best plan to increase those revenues is a nice question. Better put up with present inconveniences rather than make matters worse by useless complication.

At the time the proposed amendments were first drafted, the Patent Office, for the want of a proper examining corps, was in a disgraceful condition respecting the examination of applications; many of them were allowed to accumulate under the dust of a dozen months before they were opened.—It seemed as if a radical change in the laws was most imperatively demanded. Indeed, for a period of some years previous we had ourselves been continually directing the attention of Congress and the authorities connected with the Patent Office, to the evils inflicted upon inventors by the great length of time they had to wait before decisions were made on their cases. All this is now changed; the pile of accumulated business has been exterminated; examinations are now made within a very short period after the date of application, and it has become evident that in the hands of a vigorous executive officer the present Patent Laws are about as effective and satisfactory as any that could be devised. The happy change which has been effected since Judge Mason became Commissioner, affords us sincere gratification, and has encouraged and gladdened the hearts of our inventors. The great increase in the number of applications for patents, during the past year, is partly owing to this, for inventors, before that period, were deterred from applying for patents by the delays and troubles they suffered from this Department. We hope the present facilities for doing the business of the Office promptly and well, will not be lessened, but increased, and to do this it is necessary that the revenues should be increased. On Jan. 20th, last year, a Bill was reported by the Committee on Patents of the Senate, for this purpose, at the same time making very great alterations in the whole patent code. Some portions of that Bill we considered were very wrong, and would be the means of doing a great deal of evil if they became a statute. We pointed out the defects of the Bill on page 341, Vol. 9, SCIENTIFIC AMERICAN (July 8th,) and on the 19th following, it was recommitted to the Committee on Patents—Senator James, Chairman—who reported it back on the 24th of the succeeding month, amended in a number of the important features that we had pointed out. We have been informed privately, that the unamended Bill, as it originally read, is intended to be called up by Senator James for action, but we think this cannot be correct, he having reported the amended Bill. From our long acquaintance with the inventors of our country, and the working of our whole patent system, we ought at least to be able to form some correct opinions respecting what reforms are required, and what changes might be expected to work well or ill. We believe that a simple increase of the patent fee, from $30 to $40, would be the safest and best way to increase the revenues of the Office, *and at present no further alteration of the laws is very pressingly demanded.*

But there need be no increase of fees at all if our law-makers would insert a brief amendment, requiring that inventions, in order to be patentable, shall only be new in this country. This would greatly reduce the expense of examination—cut off the necessity of a foreign library, augment the number of patents granted, and bring about a corresponding increase of revenue.

The more simple our laws are, so much the better for all, excepting the lawyers.

American Library in Paris.

We have received a circular from Mr. James Swain, of Philidelphia—now in Paris as one of the Commissioners to the coming Exhibition in that city—appealing to American booksellers and any public-spirited individuals in our country, to make donations of American books for the "American Library and Museum" in the Hotel de Ville. The circular says:

"We hope to make a creditable appearance in the Industrial Palace, but we fear that we shall not be represented there as extensively as we were at London. It has occurred to us, under the circumstances, that we might compensate for any other deficiency by an intellectual exhibition which will give some idea of our real civilization. The magnificent collection of American books, engravings, coins, &c., made by M. Vattemare, will be inaugurated at the Hotel de Ville (City Hall) about the same time with the opening of the Palace of Industry. With this nucleus of *ten thousand volumes*, contributed by American generosity to the city of Paris, we hope to found a library and museum which will be to all time a speaking monument of national greatness—an ever-increasing proof of what we have done and what we shall do in the intellectual provinces. The chief magistrate and municipal council of Paris are disposed to co-operate with us with the most flattering cordiality. Funds have been devoted for the necessary expenses of arrangement. An apartment has been expressly appropriated for the purpose in view. The American Library and Museum will be the only exhibition open to the public in the Hotel de Ville, so that there will be nothing else there to distract the attention of visitors. It is proposed to have an alcove for every State in the Union, surmounted with its arms, the date of its settlement, the principal dates of its colonial history, the date of its incorporation in to the Union, &c. At the entrance will be the arms of the United States and France. In appropriate places will be inscribed the great discoveries and inventions made by Americans, with the names of the discoverers or inventors. The land-marks of our history will thus be permanently before the eyes of Europe. A library composed exclusively of the productions of a single people is a novelty. The world contains none such, as yet."

Busts and medals of prominent Americans will be acceptable. We hope this appeal will not be in vain: the idea is an excellent one. As the exhibition opens on the 1st of May next, there is no time to lose.

Upon every book will be inscribed the name of the donor.

Those of our countrymen who are willing and able to contribute to this enterprise, should address their contributions as follows: "International Exchanges; A. Vattemare, Central Agency, Paris."

Colt's Patent in Congress.

On the 6th inst. there was quite an exciting time of it in the House of Representatives, when discussing the merits of the bill before it for the extension of Col. Colt's patent. It seems that implications or hints had been thrown out that members of Congress could be bought, and that this Bill would pass; but members, on this occasion, showed themselves determined to remove such an impression. They expelled a reporter who was said to have an interest in the extension of the patent, this being against the rules of the house, and he had refused to stand an examination by the Committee on Patents. Some rather strange remarks were made about Col. Colt's examination by the Committee. It appears to us that the Bill will be rejected by an almost unanimous vote; we thus judge from what we have heard and what we have read on the subject, although many have asserted that any bill can be weathered through Congress by good management, and plenty of means to lobby.

The foregoing was penned on the 7th; two days afterwards—the 9th—the bill came up again, and, as we had supposed, the enacting clause was struck out by a vote of 99 to 23, and may be considered killed.

Machine for Papering Walls.

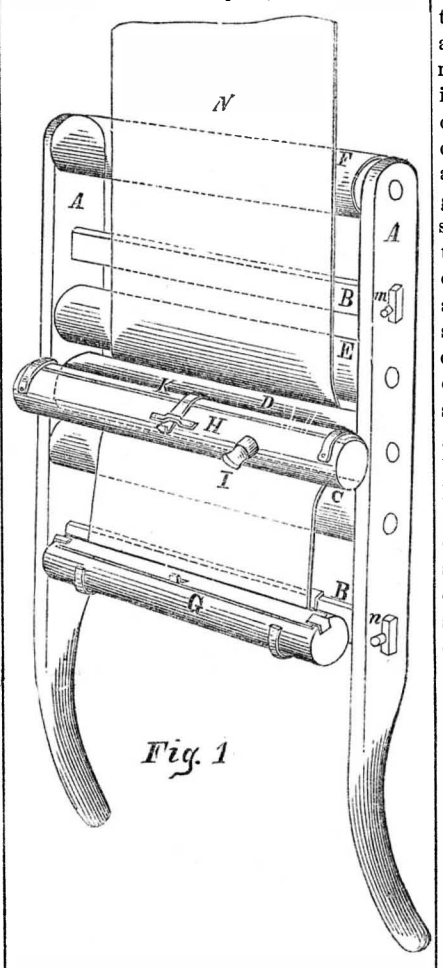

Fig. 1

This figure, which is a perspective elevation, represents a machine for papering the walls of rooms for which a patent was granted to Henry F. Baker, of Centerville, Wayne, Co,, Indiana, on the first of last November.

A A are two side bars, and B B are two cross pieces framed in the said bars, and C D E, and F are four rollers, G, and H are two tin cylinders. Cylinder G, for holding the paper, and cylinder H for holding the paste or sizing. Roller D being covered with sponge or sheepskin, or its equivalent, and roller F being covered with gum elastic cloth or its equivalent, for the purpose of pressing the paper to the uneven surfaces of the wall, and by that means press all the air from between the paper and the wall, and cause the paper to be laid on smoothly, nicely, and evenly, without the trouble of hand labor. Cylinder G has a lid to it for the purpose of putting in the paper, and has also a small orifice in front to let the paper pass through. Cylinder H has a hole, I, in the top to put in the paste and also an orifice in the bottom, next to roller, H, with a slide, K, to let on and off the paste on to roller H. M M are two keys in the end of the cross pieces framed into the bars for the purpose of taking the machine apart, when necessary to clean. It is readily perceived that the paper, N, placed in cylinder, G, passes out of it over roller, C, under, D, and over roller E and F, against the wall to be papered; and that when the paper is pressed and rolled on the wall, it will cause all four of the rollers to revolve and draw out the paste from cylinder H, and cause it to be spread upon the paper.

The patentee informs us that, by this machine, as much wall papering can be done by one hand in a given time as four or five hands without it—sizing the paper at the same time.

More information may be obtained by letter addressed to Mr. Baker.

Condensation of Steam.

Contradictory opinions have been expressed by writers on the steam engine, respecting the value of the condenser in engines; Scott Russell contends that a vacuum may be too *good*, and a decided loss of power; and Bourne asserts that in a locomotive working at a pressure of from 120 to 105 lbs. on the square inch, the efficiency of a given quantity of water, raised into steam, may be considered about the same as in the condensing engine, because the resistance of the atmosphere (15 lbs. on the square inch) is about one-eighth of the whole pressure in the former engine; and the rare vapor in the condenser (2 lbs. on the square inch) of a low pressure engine, amounts to the same resistance in proportion to its pressure. This is asserted on page 35 of his catechism, while on page 32 he says, "In a high pressure, as contrasted with condensing engines, there is always the loss of the vacuum, which will generally amount to 12 or 13 lbs. on the square inch." This would seem to be a contradiction, and yet it is not, when the effect of steam, in moving the piston, is taken into account in high pressure engines, and the saving of fuel is taken into account in the condensing engine. There is, however, another deduction to be made, from the useful saving of condensing the steam, beside 2 lbs. generally allowed for the elastic air in it, viz., the power consumed in working the air pump. The practice of Watt was to allow 28·9 cubic inches of water, at 50°, for condensing one cubic inch of water raised into steam. The cold water pump of a land condensing engine is 1-48th the capacity of the steam cylinder and the air pump is 1-6th the capacity. If it did not require these two pumps to supply and free the condenser, the whole power of the vacuum gained might be added to that of the steam, when comparing a condensing with a non-condensing engine. In marine engines no cold water pump is required, only the air pump. The estimated value of the vacuum, in a condensing engine, after deducting the power required to work the air pump, is about ten pounds on the square inch. The small amount of $5\frac{1}{2}$ cubic inches of water at 32°, will convert a cubic foot of steam into water, and the whole will then be af a temperature of 212°—the boiling point—at which no vacuum could be maintained, the temperature of the condenser therefore has to be kept at about 100°, and this is the reason why so much water is required for condensing the steam rapidly.

Commisioners to the World's Fair in France.

The people in Paris—those who know—we have been informed, are somewhat puzzled how to act in reference to the great number of Commissioners appointed to represent different American States at the Great Paris Exhibition of Industry which opens in May next. It seems that there are far more American Commissioners than articles. A number of gentlemen have got themselves appointed who have not made a single effort to send an article to the Exhibition, the preponderating majority of articles having been sent by the Commissioner from this city. Those Commissioners who have no articles to represent, expect to represent themselves, no doubt. This, we consider, will not look very flattering for our country on their part.

Cold on the Prairies.

The cold has been so severe, and the snow so deep on the western prairies, that some of the railroads were completely stopped for a number of days. On the Illinois Central Railroad a train with its passengers was caught in a snow storm and frozen up, and the wretched passengers suffered from the lack of both food and fuel. A number of them were severely frost bitten, and came near being frozen to death before they were relieved.

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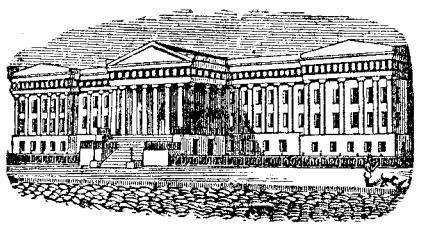

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from he United States Patent Office.

FOR THE WEEK ENDING FEBRUARY 6, 1855.

SMUT MACHINE—John Bean and Benjamin Wright, of Hudson, Mich: We do not claim the leading of a draught through the smut scourers and revolving screen irrespective of the manner of effecting the same.

But we claim supplying air to the fan of a separator, the shoe of which is arranged in connection and at right angles with a smut machine, by causing said air to pass through the smut scourers and revolving screens of said smut machine on its way to the fan, as described, and for the purpose set forth.

[A brief notice of this invention may be found on another page.]

DOUBLE-ACTING FORCE PUMP.—W. C. & J. S. Burnham of New York City: We claim the general construction of the pump as herein shown and described, viz.: having the casing, D, cylinder, E, and passage, F', arranged as shown, and cast in one piece, and secured upon the upper part of a base or circular chamber, A, having compartments, a, b, c, d, within it, and valves, e, f, g, h, upon its top plate, arranged and communicating with the several passages, as shown and described and for the purpose as set forth.

[See No. 16 present volume SCI. AM. for a description of this invention.]

MANUFACTURING SEAMLESS FELT GOODS.—John H. Bloodgood, of New York City: I claim the method of forming the various parts necessary to the production of seamless articles of felt, by the use of a movable or stationary pattern, in the manner and for the purposes described.

But I do not claim the manner of forming the bat or of uniting the several parts, as both are old and well-known processes.

DAGUERREOTYPE PLATE HOLDER.—D. N. B. Coffin, Jr., of Lynn, Mass.: I claim the peculiar combination and arrangement, substantially as described, of the block frame and bed piece, for the purposes specified, the same being constructed and operated substantially as set forth.

LIFTING-JACK FOR MOVING RAIL CARS.—Nelson B. Carpenter and John Powers, of New York City: We do not claim the jacks, AA, separately for they are well known and in common use; neither do we claim the combining in the same machine of any mechanical powers for giving a vertical and lateral motion to the object or article to be adjusted, nor do we claim the slide, E, separately or in itself considered.

But we claim the improved jack, constructed substantially as shown and described, viz: connecting two ordinary screw jacks, AA, by a frame, C, provided with an arch, D, and having a slide, E, fitted on the upper part of the frame, C, the slide being connected to the frame, as herein shown, and operated by a horizontal screw, G, for raising and adjusting railroad cars upon the track, and other analogous purposes.

[For a description of this excellent improvement in lifting Jacks, see No. 12, present vol. SCI. AM.]

CURRENT WATER WHEELS.—Richard Deering, Sr., of Louisville, Ky.: I claim the concave flanged screw, in combination with the conical body or center, as and for the purposes set forth.

Also, the arrangement herein described of hanging the water wheels and other machinery in framing, adjustably connected with the vessel or scow, whereby they may be raised or lowered, for the purposes specified.

AXLE BOX ROLLERS.—George W. Geisendorff, of Indianapolis, Ind., and Jacob C. Geisendorff, of Cincinnati, Ohio: We claim the giving a positive motion or rotation to the lubricating roller, by the axle of the car wheel, in the manner set forth.

CORN AND COB CRUSHER.—John S. Griffith, of Huntington, Pa.: I claim the combination of platform, p, holders, q, and knives, l, arranged with the crushing frustums and concaves, as constructed and operating, for the purposes set forth.

WIRE CLOTH FLOUR BOLT.—F. B. Hunt and Elias Nordyke, of Richmond, Ind.: We do not claim a wire cloth bolt with revolving brushes working within it, for they have been previously used.

But we claim the peculiar means shown for graduating the pressure of the brushes, F, against the wire cloth of the bolt, viz.: the loose hubs, I I. on the shaft, C, being attached by arms, H, to slides, G, which work on the outer sides of the stationary arms, c, the outer end of the slides, G, being attached to the brush bars, F, which fit in the forked ends of said arms, c, the hubs, I I, by being moved on the shaft, c, expanding or contracting the brush bars, as desired, the hubs being secured in the proper position by the rods, g, J.

[For a notice of this invention see another page of the SCI. AMERICAN.]

ELLIPTICAL ROTARY PUMPS.—Birdsill Holly, of Seneca Falls, N. Y.: I claim the corrugated or grooved pistons or cogs, in the manner and for the purposes specified.

BURGLARS' ALARM.—Daniel Haldeman, Morgantown, Va.: I do not claim the letting off an alarm in the act of opening a door, nor do I claim an alarm which requires fastening of any kind, either to the door or floor, to ensure its going off, as several of these are already known.

But I claim combining with the trigger, lever or dog, which holds the hammer at a cock, a hinged inclined lever, G, the end of which simply passes underneath the door, and requires no fastening other than it receives by being held by the door itself as it is pushed open, as described.

REPAIRING ROADS—Alpheus Kimball, of Fitchburg, Mass.: I claim the described machine for making road, consisting essentially of the combination of the plow and scraper, constructed in the manner set forth, and suspended from the lever, H.

Second, I claim pivoting the rear axle and securing it to the frame work in a position oblique to the direction of motion, for the purpose described.

PRESSING HATS AND BONNETS.—S. E. Pettee, of Foxborough, Mass.: I do not claim the pressing of hats by machinery, nor the use of heated materials or damp cloths, as such.

But I claim the combination of the curved heated bedplate, A, with the roller, H, for the purpose of pressing hats and bonnets, whereby I am enabled to use a rolling pressure, in contradistinction from a sliding pressure given by smoothirons, or any other, substantially the same.

STREET-SWEEPING MACHINE.—R. A. Smith and John Hartman, Jr., of Philadelphia, Pa.: We make no claim to the employment of the endless chain of brushes, or the movable inclined plane; neither do we claim of itself the detachable dirt receiver, or the receiver when arranged and operated as in the patented machine of J. Whitworth.

But we claim the described arrangement of detachable receiver, R, beneath the forward portion of the frame, suspended by chains, m and n, attached to hooks, q, on the receiver from the pulleys, f', and windlasses, p p', so that an empty receiver may be substituted for a filled one with great facility, and the filled receiver removed by a tender, as set forth.

We also claim constructing the rear portion of the inclined plane with wheels or rollers, h, and tail piece of loose sections, l, as set forth, so that the rear of the machine may rest on the ground and conform to the inequalities of its surface.

We further claim the employment of the hinged stud, u, in connection with the driving wheel, W, and loose wheel, D, for operating the endless chain of brushes, as set forth.

CRUSHING AND GRINDING MILL.—Joel Weigle, of Swan Station, Pa.: I claim combining with the crusher, b, and the grinder, c, the casings, d, e, in such a manner that the said crusher and grinder can be adjusted in a longitudinal direction, and the casing, d, of the crusher be adjusted in a lateral direction, substantially in the manner and for the purpose set forth.

STEAM GENERATORS.—William Montgomery Storms, of New York City: I claim, first, enclosing a thermostat in a steam-tight space, forming a part of the steam-conducting passage to the engine, and from such thermostat forming an exterior and adjustable connection to a cock or valve, as C', located in the exit pipe of the boiler in such manner that being moved by the thermostat it shall direct more or less of the steam through the super-heater; the whole device, by acting in conjunction, thus controling while being actuated by the temperature of the steam going to the engine.

Second, I claim regulating and tempering the heat in the desiccator by the admission to it, as may be necessary, of waterfrom the boiler, by means of an especial communication, as pipe O', the quantity admitted being governable by the adjustment of a cock, as P', all substantially as explained.

COMBINED CHAIR AND CRIB FOR CHILDREN.—William B Carpenter, of New York City: I claim the chair, B, in combination with the standards, c c, and hinged thereto at A, when constructed and arranged so that by the reversal of the chair, as described, the whole forms a high and low chair and crib for children, substantially in the manner set forth.

LOCOMOTIVE TRUCKS—John Cochrane, of Baltimore, Md.: I claim as the method of neutralizing or preventing the vibratory tendency of the trucks of locomotive engines, caused by the direct action of the forces which operate the truck driving wheels, by means of the steam or hydraulic brace, substantially as described.

CONSTRUCTING SHIPS AND OTHER VESSELS.—V. P. Corbett, of Corbettsville N. Y.: I claim the arrangement shown and described of the india rubber or elastic and water proof pad, covering or lining on the back of the inside lining and bracing planking and between the said inside planking and the stiffer or more solid outer timbers or frame work of the hull of the vessel, the same serving to form a stout elastic cushion or pad bearing for the inside planks to rest upon in their union to the outer frame work of the ship, and constituting a planked elastic pad inside casing to the vessel, for operation in the manner for the better accomplishment of the several purposes of protection, freedom from injury and facility of repair, essentially as specified.

[This is a most useful invention, which we shall describe in the SCIENTIFIC AMERICAN as soon as several applications for foreign patents are issued.]

STEAM BOILERS.—Thomas Champion, of Washington, D. C.: I claim, first, arranging an annular flue, Q, at the bottom of an upright boiler for receiving the air at its mouth, and conducting it at R 2, beneath the grate, as illustrated in figure 5 of the drawings.

Second, Making the vertical tube in the form of a double cone, the upper cone being inverted and the two united together at their apices, the same being for the object and possessing the advantages stated.

MANUFACTURE OF PAPER PULP.—Henry Glynn, of Baltimore, Md.: I claim introducing into the pulpy mass soluble soaps of wax or fats, made as set forth, converting the same into insoluble soaps within the pulp by means of soluble salts, substantially as described, for the purpose of preventing forgery, mildew, and the action of insects, rats and vermin.

SOUNDING BOARD FOR PIANOFORTES.—James A. Gray, of Albany, N. Y.: Of course I do not confine myself to any particular form or number of corrugations, but any number that may be necessary.

But what I claim is the improvement of the sounding board of the pianoforte by corrugating its surface, thereby increasing its sounding surface and giving it sufficient stiffness or strength without gluing cross bars on either side.

GRASS HARVESTERS.—Jas. H. Maydole and A. W. Morse, of Eaton, N. Y.: We claim the combination of the adjustable and controlable roller, a, with a grass harvester, substantially and for the purpose set forth.

SEWING MACHINES.—I. M. Singer, of New York City: I claim imparting the feed motion to the needle to move the cloth or other substance, to determine the space of the stitches to be made therein, by a feed hand or its equivalent, receiving the required motion from the mechanism and acting against the needle, in close proximity to or in contact with the cloth, substantially as and for the purpose specified.

MOP HEADS.—James A. Taylor, Alden, N. Y.: I claim to be the original and first inventor of the combination of the handle, A, and the bars, B, D, with the cord, C, or its equivalent, the whole being constructed and combined and operating substantially as set forth, or in any other manner substantially the same.

BUTTER WORKERS.—J. M. Williams, of Blanchester, Ohio; I claim a hollow cone in combination with a conical roller working on its apex, constructed in the manner and for the purpose substantially as described.

GRAIN AND GRASS HARVESTERS.—Cyrenus Wheeler, of Venice, N. Y.: I claim the combination of the double-edged cutters, r r, with the cutter bar, x x, the braces, z z, the vibrating cutters, l l, their shanks, m m, projections, u u, the circular ribs, t t, the bolts, p p, the springs, a, the holes, q q, the ribs, d, the cavities, y y, or their equivalents, as substantially set forth, the whole forming the cutting apparatus of the machine.

Second, I claim the revolving or track rake, consisting of its frame, I, its wheel, 3, shaft, 4, pinions, 7, 10, shaft, 6, wheel, 5, teeth, 8, apron, 2, joint, 9, and cap, 11, or their equivalents, arranged and combined substantially as set forth.

COMPOSITIONS FOR BLEACHING AND STUFFING LEATHER.—L. W. Fiske, of Louisville, Ky.: I do not intend to claim the use of the ingredients therein named separately, or in other combinations employed for the same or analogous purposes.

But I claim the improved mode of bleaching and stuffing leather, before described, by using the bleaching and stuffing compounds, made of the ingredients or their equivalents in the proportions and in the mode specified, substantially in the manner and for the purposes set forth.

WORKING LIMING VATS IN TANNERIES.—L. W. Fiske, of Louisville, Ky.: I claim using a close covering for liming and unhairing-vats, in the manner and for the purposes set forth.

CHURNS.—Hazen Webste , of Ogdensburg, N. Y.: I do not claim the device of a disk rotating at the bottom of the churn tub upon a vertical axis, nor do I claim the use of a tubular stem upon such a disk for admitting air beneath it, as these have been used before with the churn of S. P. Francisco, patented, June 19th, 1849; nor do I claim mounting an agitator upon such disk, as the same was proposed by said Francisco.

But I claim in combination with such rotating disk, that form of the agitator which occupies the central portions of the disk, and sweeps toward the circumference in a spiral shape with rounded angles, and is surmounted towards the circumference with one or more vertical breakers, and this I claim, whether used with or without the air passages herein described.

RETAINING CARS UPON THE TRACK.—Geo. P. Ketcham, of Bedford, Ind.: I claim the employment or use of arms, C, applied to the axles, c, d, of the trucks, A A', the arms of each truck being supported by the rod, d, the above parts being constructed and arrauged in the manner and for the purpose as herein shown and described.

[See notice of this invention on another page.]

RE-ISSUE.

CONSTRUCTING A COMBINED CALDRON AND FURNACE FOR THE USE OF AGRICULTURISTS AND OTHERS.—J. L. Mott, of Mott Haven, N. Y. Patented Dec. 1st, 1840; extended, Dec. 1st, 1854; I claim, first, combining a caldron with a portable furnace having a fire chamber of smaller size than the area of the caldron, by spreading out and extending the sides of the furnace to form an outer casing partly or wholly surrounding the caldron, and forming a flue space between the two, leading to the exit pipe, substantially as and for the purpose specified.

I also claim making the casing to orm the flue space around the caldron by elevating and spreading out the plates of the furnace and fitting to and combining therewith sectional side pieces, substantially in the manner described and for the purpose specified.

ADDITIONAL IMPROVEMENT.

SEED PLANTERS.—J. Graham Macfarlane, of Perry county, Pa. Additional to Letters Patent, dated March 14, 1854: I claim the attaching the box or hopper to the beam and handles by means of holes left in casting the box, or any equivalent device, also in placing the bottom of the lime box below the slide for the purpose of preventing the lime choking the machine and impeding its action substantially as described.

Potatoes have been cultivated at Fort Simpson in 62° N.

Clearing Land.

MESSRS. EDITORS:—In this inventive age, cannot some cheap means be devised for felling timber? The slow process of hand-chopping seems to be unworthy of the spirit of the times. Inventive genius has turned its mind to discovering means for *making*, but here in this wooded county, our greatest primary want is a machine for *destroying*.—There is not an acre of our Western forest lands that is not dearly paid for in the terrible labor of getting rid of the timber.

We have seen a lifting locomotive hoisting machine in our cities, and it has occurred to us that a circular saw could be so connected as to answer for cutting trees. If even a single cut to the center of the tree, on one side, were all that could be relied upon, it would be a great saving of time and money.

Where the timber is not heavy, the ordinary stump extractor might perhaps be applicable, with some modification. The top seems as if it would help the fall of the tree, when the root is loosened.

Again, when we see vast blocks of iron cut in twain, as thread is severed by the scissors, it inspires hope that something may be contrived, a little in that order of mechanical power, to achieve so valuable an object as the cheap and speedy clearing of forest lands. If there be hope, the SCIENTIFIC AMERICAN can inspire it; and one who has derived priceless benefits from its instruction, ventures to make this appeal to its kindness, trusting it will see in the suggestions offered, both interest to its readers and a probable field of profit to inventors.

ANTHRAX.

Philadelphia.

[Two patents have been taken out for circular saws to fell standing timber—one by Jas. Hamilton, of this city, June 26, 1835, and the other by Walter Hunt, also of this city, on the 6th of January following. These are the only inventions of which we have any knowledge, that have been proposed for felling timber by machinery. They no doubt were defective in principle and action, or we would have heard more about them. A common circular saw could not fell standing timber, be the power applied to it, as great as that for driving the largest locomotive. Machinery for cutting down standing timber, must embrace very peculiar features, as every person knows, who is acquainted with chopping. Most trees can be cut so as to fall in three directions; while a perfectly straight tree can be made to fall in any direction. In felling a tree, it is necessary to make the first cut of such a form as will incline it (the tree) in a given direction; this is done by the wide cut made by the axe, which causes the greatest weight of the tree to settle to the one side. There is no fear of binding an axe in the cleft, by hand chopping, but a circular saw would bind, if it cut horizontally before it penetrated six inches deep. It would be necessary therefore, in employing a circular saw for cutting standing timber, to make it so operate, as to cut its way in, by sawing a wedge-shaped block *out*. Six years ago, a very ingenious mechanic of this city consulted us respecting an invention of his for cutting down standing timber by the use of a circular saw. When we had examined his model, we immediately answered: "you were not brought up in the backwoods." "How do you know that?" he replied. "By your model; your saw will bind in its cut before it penetrates to the depth of six inches." He was convinced of this by a very few words of explanation. A smart chopper will cut down trees of from one to two feet in diameter, of clean light timber, as fast as a portable engine and saw could be moved about in the woods and placed in position to operate. We would not wish to be understood as asserting that machinery could not be invented to cut down trees for the clearing up of land, but this can only be attempted with any hopes of success, by persons acquainted with the difficulties to be surmounted, and who can form a sound opinion of the economy of the two methods—machine and hand labor. The man who invents the first successful machine for cutting down standing timber economically, will, we think, make a fortune, but he has no easy task before him; yet what is it that our countrymen cannot do in the invention of machinery, when their minds are set upon it?

The Lancaster Gun.

MESSRS. EDITORS:—In the casting of cannon balls, it has been found impossible to have every part of the ball of equal density; therefore its center of gravity cannot be made to coincide with its center of magnitude. In consequence of this it will not leave the mouth of the cannon in a line mathematically true, unless the line joining its center of gravity and its center of magnitude coincide with the axis of the bore of the gun.

The oval grooved gun is designed to correct this error, by giving a circular motion to the ball, similar to that which a rifle gives to a bullet; let us see whether it will answer the required purpose. Every point of the ball, center of gravity included, will rotate round the axis of the gun, while the ball is moving out of the barrel, and this rotary motion, combined with the forward motion of the ball, will cause each individual point to describe a screw. But all the engineers in the universe cannot make the center of gravity continue this screw motion after the ball leaves the muzzle. In whatever direction the center of gravity is moving, in that direction the ball will go. The error would be small, yet I should suppose it would be nearly as great as in the common gun.

Now, if the learned graduates of Woolwich will listen to so humble a person as myself, I think I can tell them how to shoot at the Russians without any error from unequal density of the different parts of the ball. Let every ball be floated in mercury, and that point which rests uppermost marked; then, when the cannon is to be loaded, let the marked part be nearest the muzzle.

J. NEWCOMB.

Sudlersville, Md., Feb. 2, 1855.

[The principle of the rifle consists in "giving the bullet a rotary or spinning motion round its axis, and keeping that axis as near as can be coincident with its line of flight or progressive motion; thus enabling the bullet to overcome any undue deflection, by presenting its irregularities of weight and form in circular succession to the friction of the atmosphere, during the whole course of its flight."

Robins, in speaking of the deflection of a bullet from a smooth bore, says: "If it be asked what can be the cause of a motion so different from what has been hitherto supposed, it may be answered, that the deflection in question must be owing to some power acting obliquely to the progressive motion of the body, which power can be no other than the resistance of the air. And this resistance may, perhaps, act obliquely to the progressive motion of the body, from inequalities in the resisted surface; but its general cause is doubtless a whirling motion acquired by the bullet about its axis; for by this motion of rotation, combined with the progressive motion, each part of the bullet's surface will strike the air in a direction very different from what it would do if there was no such whirling: and the obliquity of the action of the air arising from this cause will be greater, according as the rotary motion of the bullet is greater in proportion to its progressive motion."

It appears to us that conical bullets can be cast of a uniform density, but these, in a smooth bore, will not do so well as in a rifle.

Papier Mache Manufactory.

The progress in the manufacture of papier mache, since its introduction into this country, has been most remarkable. A company was started in this line in Boston two years ago, when the art was in its infancy, and now they are doing an immense business and sending articles from their extensive establishment all over the Union. There are now two large factories in Roxbury, Mass., in constant operation, and another factory of great size is soon to be erected.

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TO CORRESPONDENTS.

C. C., of N. Y.—Smee's work on Electro Metallurgy will give you the information desired. You can find the price at the book stores.

S. C. N., of N. Y.—We regard your proposition in propulsion as impracticable.

W. C.F., of N. Y.—H. Ruttan, Esq., of Coburg, C. W., is the inventor of the best plan of ventilation with which we are acquainted. Correspond with him, both in reference to dwelling and barn. We know of no cheaper motive power to employ for irrigation than the wind-mill. The cost of Artesian wells increases with their depth. Cannot inform you as to the muslin preparation.

J. T., of Ohio—Air expands to double its volume by the application of four hundred and ninety degrees of heat.—Water expands to seventeen hundred times its bulk by the application of twelve hundred and twelve degrees—some say less.

H. J. R., of Pa.—The time cannot be far off when coal or coke will be used on all locomotives.

J. M., of Me.—We do not know where you can get the machine you need. We do not understand your steamer invention.

W. H., of Pa.—Lasts made in sections and spreading in different parts by the turning of screws, are not new. Perhaps your particular combination is new, and if so, patentable. To determine on those points we need a model or sketch.

B. P. B., of Pa.—Your ideas are good, but old. Dividing vessels into compartments, providing inflatable vessels all connected by tubes, and extending the steam pipes to apartments, are plans well known, and on some vessels the steam pipes are in use.

D. P., of N. Y.—Yours has been received.

A. A., of Me.—See the advertisement of S. C. Hills with regard to a small steam engine. We cannot give any more information on the other subjects to which you have alluded.

G. W. S., of N. Y.—If you will inform us what numbers are wanting, we will supply such as we may have of them.

W. H. C., of Ill.—The adaptation of sheet metal riddles for grain separators could not be patented. *Coal* screens for separating ashes from the coal are usually provided with the same kind of riddle as you describe.

S. C., of Va.—We know of no better way for you to find customers for your railroad sleepers than to advertise them in our columns. They are an article in great demand in many sections of the country.

H. W., of Vt.—A citizen of this country cannot obtain a patent in Canada unless by special act of Parliament, which convenes at Montreal. They have no patent laws in Canada which provides for protection to any but their subjects.

S. C. of Va.—The idea of resting vessels upon capacious air-tight drums, on the periphery of which are the floats for propulsion, is far from being new. A modification from your plan we took patents for in this country and England, for a Capt. Tucker, some years ago. The $30 we have applied towards the fees on your valve motion, which we are now preparing the application for.

L. F. H., of Vt.—You ask if air is necessary to the production of butter. You also state that you are a mechanic, and have reasoned on the subject, although not a farmer. You appear to have reflected correctly. All churns are made to admit air as necessary to form butter in churning but you can churn butter in a bottle, tightly corked.

J. W.R., of N. H.—If you will send us one of your miter boxes, or the Letters Patent, we will inform you by mail what the expense of engravings will be. We cannot give you the information solicited without first knowing the amount of work it would require to prepare them suitable for our use.

F. B. C., of Miss.—The multiplicity of your inventions have no doubt befogged you, and we would advise you to abandon all but the best, and experiment on that until you get it as near perfection as possible, and then apply for a patent. An inventor can no more manage a dozen different inventions well, and do them all justice, than a merchant can carry on a dozen branches of business, under different heads, and neglect none of them. It is folly to get too many irons in the fire in any business. A concentrated mind produces the greatest results in inventing, as in every thing else.

J. R. M., of C. W.—Your water wheel is similar to hundreds in the States. It is a very good one, and you deserve credit for inventing it, you not having been acquainted, as you state, with any but those in Canada.

T. P., of Ky.—Your brick press is a good one, but there is only a small part of it patentable—that relating to the discharge.

H. B., of Ohio.—We thank you for your compliments respecting the minute directions for dyeing, and are glad you have been benefitted.

W. McQ., of Pa.—There can be no question about the correctness of your views regarding the electric fluid.

E. H., of Ohio.—The Ericsson is no more a caloric ship, but a steamer. You had confidence in what we said, and you say that the result was never doubted by you. We have been informed that the Ericsson is going to use an outside condenser, which will soon be abandoned also, or we are very much mistaken.

E. & B., of Ill.—You will please to bear in mind that American citizens are debarred the privilege of taking patents in Canada. The law excludes all who are not subjects and inventors of the device to be patented.

H. F., Jr., of Pa.—The question you propound has been submitted to us before. We cannot throw any satisfactory light upon the subject. It must rest upon mere conjecture.

R. E., of N. Y.—We think your improvement in railroad switches possesses novelty of a patentable character. It would operate very well, but we doubt whether companies would adopt it. They have always been very shy of switches operated by the weight of the locomotive. Please send us a model if you decide to prosecute a patent.

J. C. H., of Miss.—You could not patent your system of signalling by the use of air tubes in keeping flags flying in advance of each train. This plan is superseded by the use of the telegraph, signalling the arrival of trains at the different stations along the route. $5 received for subscriptions.

J. B. S., of Ct.—The water wheel of Reuben Rich was patented July 8, 1842. It will expire July 8, 1856.

T. H. C., of Iowa.—Haswell's Mechanics and Engineers Companion is a very useful work on mechanics, published by Harpers & Brothers, this city; price about $1.25. We thank you for the increase of your subscription list.

J. W. M., of N. H.—Your alleged improvement in devices for unshackling railroad cars, appears to be a good one, and so far as we can judge, it possesses patentable characteristics. You had better send us a model of it, made according to the proportions laid down in the circular which we have mailed to your address.

M. G. C., of Pa.—We replied to your letter of the 9th ult on the 17th ult., by mail, and stated that we did not think your alleged improvement in pipes could be patented. See advertising page for information about stave machines.

H. B. H., of Ohio—We do not think our designer will be able to make the alterations you suggest for the engraving, without the aid of another model. This will be the surest way.

E. B., of Mass.—Your book holder will not interfere with the book brace. We think they are used for entirely different purposes, although we have not examined the latter.—Had you not better send us a model of your invention.

"Pacific," of N. C.—The reply to which you refer was intended for you. We cannot say more in reference to your process.

H. E. D., of Pa.—You must send us a model of your water wheel for examination before we can give any advice in regard to its novelty. From the description given we do not find anything novel in its construction.

S. O., Conn.—Yours has been received, and will meet with attention.

F. N. B., of Wis.—The great object is to regulate the supply of steam automatically to the marine engine with great rapidity, according to the work it has to do. Your plan has been applied to land stationary engines by the governor.

W. D. M., of N. Y.—The common substance to put on emery cloth is glue. We do not know of a better, at present.

T. W. McK., of Pa.—Your improvement in locomotives for burning coal appears to be good. We hope that no other than coal burning engines will be running in three years from the present date.

C. Ten B., of N. Y.—There are sixty-two and a half pounds in a cubic foot of water. A gallon amounts to ten pounds. How can we tell you the power of your wheel unless you give us the quantity of water and the hight of the fall? You must find out the quantity of water yourself.

R. R. McD., of La.—The best proportions you can use for the cement, is six of sand to one of white lead.

Money received on account of Patent Office business for the week ending Saturday, Feb. 10:—

E. A. J., of N. Y., $30; C. W. F., of Mass., $65; S. H., of N. Y., $55; C. C., of Mich., $25; I. G., of Ct., $25; N. E. G., of Miss., $30; J. W. P., of Va., $32; G. G., of Ct., $50; D. W., of N. J., $30; W. & P., of Ct., $30; J. G., of N. Y., $30; W. G., of N. J., $30; M. S., of ——., $8; B. & H., of N. Y., 425; T. N. L., of Va., $25; R. & A., of N. Y., $250; P. M., of Ill., $30; S. L. M., of N. J., $30; J. B., of O., $25; A. J. S., of N. Y., $30; J. W. D., of N. Y., $30; S. & C., of N. Y., $10; J. W. H., of R. I., $15; W. T. M., of Pa., $20; S. C., of Va., $30; G. D., of Ind., $25; J. R. G., of Pa., $5; S. McF., of Pa., $30; G. & G., of L. I., $30; H. & A., of N. Y., $25; L. & S., of O., $20; E. B. L., of L. I., $25; J. J., of N. Y., $35; J. M. B., of N. Y., $—.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Feb. 10:—

S. H., of N. Y.; T. N. L., of Va.; H. & A., of N. Y.; E. R., of O.; I. G., of Ct.; B. & H., of N. Y.; S. & C., of N. Y.; J. B., of O.; G. D., of Ind.; J. W. H., of R. I.; G. M. Jr., of Ill.; N. L., of Ind.; E. B. L., of L. I.; J. J., of N. J.

Important Items.

MODELS—We are receiving almost daily, models of inventions which have not the names of their inventors marked upon them. This usually prevents us from taking any notice of them whatever. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and sometimes prevent the model from being mislaid.

BACK NUMBERS AND VOLUMES—We have the following num bers and volumes of the SCIENTIFIC AMERICAN, which we can supply at the annexed prices:—Of Volume 5, forty numbers; price in sheets, $1; bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, complete in sheets, $2; bound, $2,75.

☞We are able to furnish all the back numbers of the present volume of the SCIENTIFIC AMERICAN, and to new subscribers we shall continue to send the back numbers as long as we have them, so as to render their volumes complete.

PATENT CLAIMS—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

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1* FRANCIS H. SMITH, Baltimore.

MUSIC—PRESCOTT & BROTHERS make, at Concord, N. H., after their own patented invention (April 17, 1849,) the best Melodeons, Seraphines, and Reed Organs to be found in the country, and at lower prices for the quality. 23 3*

TENON MACHINES—To Correspondents and others—A machine may be seen in operation at and during the present Exhibition of the M. Mech.'s Institute, Washington City. B. R. EAMES, Agent, C. P.S. WARDWELL, Patentee, Lake Village, N. H. 23 3

AGENTS—Ladies or Gentlemen—Wishing to engage in the sale of an article (patent applied for) which is needed in every family—large profits and no risk—would do well to address CUYKENDALL & CO., Rochester, N. Y. 1*

American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—MESSRS. MUNN & CO., Publishers and Proprietors of the SCIENTIFIC AMERICAN, continue to prepare specifications and drawings, and attend to procuring patents for new inventions in the United States, Great Britain, France, Belgium, Holland, Austria, Spain, etc., etc. We have constantly employed under our personal supervision a competent board of Scientific Examiners, which enables us to despatch with great facility a very large amount of business. Inventors are reminded that all matter intrusted to our care are strictly confidential, and hence it is unnecessary for them to incur the expense of attending in person. They should first send us a sketch and description of the invention, and we will carefully examine it, state our opinion, and the expense of making an application, if deemed new and worthy of it. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps toward making an application.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

It is very important that trustworthy and competent agents should be employed in securing patents, as great care is necessary in the preparation of the papers, as well as integrity in taking proper care of the case until the inventor is duly invested with his legal rights. Parties intrusting their business in our hands can rely upon prompt and faithful attention. Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that the largest proportion of patents applied for in the U. S., go through our agency.

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LAWRENCE SCIENTIFIC SCHOOL—Harvard University—The next Term of this Institution will open on the first day of March, 1855, and continue twenty weeks. Instruction by Recitations, Lectures, and Practical Exercises, according to the nature of the study, will be given in Astronomy, by Messrs. Bond; Botany, by Prof. Gray; Chemistry. Analytical and Practical, by Prof. Horsford; Comparative Anatomy and Physiology, by Prof. Wyman; Engineering by Prof. Eustis; Mathematics, by Prof. Pierce; Mineralogy, by Prof. Cooke; Physics, by Prof. Lovering; Zoology and Geology by Prof. Agassiz. For further information concerning the School application may be made to Prof. E. N. Horsford, Dean of the faculty.
Cambridge, Mass., January, 1855. 23 3*

THE NEW BRICK MACHINE—Was last season in daily operation at my yard, on Locust Point. If driven by steam, the clay is taken from the bank, passed through a pulverizer (which removes the stone) into the soak pit, where it receives the water: thence to the machine which is geared to make 6 1-2 revolutions per minute, turning out five bricks each time, or 1750 brick an hour, including contingencies. Nine men and five boys, all common laborers, take the clay from the pit and place the bricks on the floor. If there be no stone the pulverizer is not required; the clay is then thrown into the pit, mixed with water, and after remaining all night is ready for use. Machine $400; Pulverizer $75, with right to work it. FRANCIS H. SMITH.
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PARTNER WANTED—Active or silent, with about $15 000 capital, in a well established foundry business. The firm has been doing a business of over $50,000 for the last year with about $8,000 profits and wishes to enlarge the same. To a silent partner ample security will be given, and 15 per cent. on the above capital guaranteed. Address R. E. SCHROEDER, box 753, Rochester, N. Y. 1*

NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. 65 Iron planers of all sizes: 350 Engine and Hand Lathes, all sizes; 50 Upright and Horizontal Drills; 25 Bolt Cutters: 10 Gear Cutters; all kinds and sizes of Chucks, Slide Rests, Hand Drills, &c. These tools are of superior quality, and as they are built by the quantity, can be afforded and will be sold at low rates. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven. Conn. 21 tf

TO MILLERS.—BOOTH'S PATENT GRAIN SEPARATOR— Manufactured at Cuyahoga Falls. Ohio, warranted to be the best thing of the kind ever used for milling purposes, with horizontal and perpendicular blast, also improved shaking riddle of perforated copper, giving a smooth surface, cleans from 10 to 500 bushels per hour of wheat, corn and buckwheat. Sections where garlic, oats, smut balls, etc., are troublesome, it is indispensable to the manufacture of good flour. A more particular account will be given by addressing the manufacturer at Cuyahoga Falls, Ohio.
21 6* J. L. BOOTH.

IMPORTANT IMPROVEMENT—In Rotary Planing, Tonguing and Grooving Machines. Patented November 21st, 1854. These machines have been thoroughly tested, and their superiority over all others proved beyond a doubt, They will plane very much better and faster than any others now in use, never tearing or throwing out loose knots. Applications for rights and machines, or for further particulars can be made to the patentee. JAMES A. WOODBURY,
Winchester, Mass., Jan. 5, 1855. 18 4eow*

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 19 eowtf

JOHN STOKELL, Jr.—No. 26 Platt st., New York, manufacturer of Regulators for railroad companies, watchmakers, and others: clocks for churches and public buildings of any kind. Models of machines and light machinery in general. 21 6eow*

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc.
CHARLES W. COPELAND,
14 13eow Consulting Engineer, 64 Broadway

MACHINERY—S. C. HILLS, No. 12 Platt st., N. Y. dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers; Dick's Punches, Presses, and Shears: Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 7 e3w

TO ENGRAVERS AND CALICO PRINTERS—The subscriber would like to sell State, county, or individual rights for his patent self-acting punching apparatus for shading small pattern and plain figured. It can be attached to any old screw machine for a trifling expense, and is warranted to give satisfaction or no pay. Reference, Messrs. Abbot & Saunders, Crompton Print-works, Warrick, R. I., James Arthuren, foreman engraver. Baxendale's patent eccentric doctor motion also for sale. For further particulars address JAMES BAXENDALE, care B. Dean & Son, Providence, R. I. P. S. Wanted, an old second-hand screw engraving machine. 22 2*

PORTABLE STEAM SAW MILL ENGINES—Silver Medals awarded by the Franklin Institute and Pennsylvania State Agricultural Society in 1851, 1853, and 1854. A number of these engines are now at work driving portable up and down, and circular saw mills, also mills where the water power has failed. Circulars will be sent by addressing the inventor, A. L. ARCHAMBAULT, 15th and Hamilton sts., Philadelphia, Pa. N. B. Portable engines always on hand. 22 4*

ELECTRO MAGNETIC MACHINES—Telegraph Registers, Receiving Magnets and keys manufactured and for sale at No. 3½ South Seventh street, Philadelphia, by W. C. & J. NEFF. 22 7

TEVIS & BARBAROUX, LOUISVILLE, KY.—Manufacturers of Steam Engines, Mill Machinery, superior Force and Lift Pumps, cast iron Screw Pipes for gas, steam, or water, largely used by railroads in supplying water stations, or suction pipes for pumps, etc., etc., being cheaper and better than copper or lead. Tobacco, Lard, Timber, and Mill Screws, always on hand. Cast iron Railings, Railroad and Car wheels, other castings for railroads, and general job work. 20 4*

ANGLO AMERICAN AGENCY—Office No. 20 Hatton Garden, London, for the introduction and sale by commission of American Manufactures, machinery, Inventions, and articles suitable for the European and British markets. Parties desirous of introducing their goods to the notice of the European public, will find this the most advantageous, direct, and economical method. All communications must be post-paid, addressed to No. 20 Hatton Garden, London. 21 4

A CLIPPER AMONG THE MONTHLIES—The Monthly Nautical Magazine, devoted exclusively to the Maritime interests of the United States, embracing ship-building, commerce, navigation, and marine engineering—will commence its second volume in April, 1855, enlarged to 96 pages. This work contains draughts of some of the finest vessels of the age, with other engravings, and is one of the most valuable publications in the country. Terms, single copies $5 per annum, or $2,50 per volume. Club Rates—Five copies for $20: twelve copies for $50. Sample copies sent when requested. Address GRIFFITHS & BATES, Editors and Proprietors, 79 John st., New York. 21 4

OUR CATALOGUE, of Optical, Mathematical, and Philosophical Instruments, in pamphlet form: a new edition, with numerous illustrations, is now in press and will be issued in a few weeks. This Catalogue is furnished on application, and sent by mail to all parts of the United States and the Canadas free of charge.
McALLISTER & BRO., Opticians,
(Established in 1796,) at their new store, 194 Chestnut street, Philadelphia. 21 3

HUB MORTISING MACHINE—Price Reduced—We have finished a few of Roys and French's patent, undoubtedly the best machine for the purpose ever invented. We will take back the machine and refund the money, in all cases, if they fail to satisfy buyers. Wagon and carriage makers will do well to give them a trial. They will bore and mortise thirty to forty hubs a day, and answer also for other work.
20 4* TEVIS & BARBAROUX, Louisville, Ky.

TO LET, WELL LIGHTED ROOMS with Steam Power—at low rates, in the new buildings 7, 9, 11, and 13 Canal, corner of Elm: and 98, 100, and 102 Walker. Apply to M. J. GAUDU, Engineer, 102 Walker st. 20 4*

MACHINE GROUND CIRCULAR SAWS—(Patent applied for.) Mill men would do well to try these saws, are perfectly free from thin or thick places, can be used thinner and with less sett, and run faster than any other hitherto made. All diameters and thicknesses warranted perfectly true. HENSHAW & CLEMSON, 31 Exchange street, Boston. 19 8*

THE FRENCH EXHIBITION—Parties who have applied for space in the French Palace of Industry, and who do not intend to be present at the Exhibition, are recommended by the undersigned to arrange with Messrs. Gardissal & Co., No. 29 Boulevard St. Martin, Paris, who are prepared to put upon Exhibition, attend, and effect sales of articles intrusted to their care. It is a responsible concern. S. H. WALES, State Commissioner, Scientific American Office.

BUFFALO MACHINERY DEPOT—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 13 tf

PATENT DRIERS—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 13 tf

NORCROSS ROTARY PLANING MACHINE—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.
Rights to use N. G. Norcrois's patented machine can be purchased on application to N. G. NORCROSS,
208 Broadway, New York.
Office for sale of rights at 208 Broadway, New York; Boston, 27 State street, and Lowell, Mass. 16 6m*

CHEAP LIGHT—A. M. MACE, manufacturer of atmospheric or Benzole Gas Machines: size from 2 to 1000 lights. All orders promptly executed corner of Main street and Harrison avenue, Springfield, Mass. 15 3m*

MACHINISTS TOOLS—SHRIVER & BROS., Cumberland, Md., (on B. and O. Railroad, midway between Baltimore and the Ohio River,) manufacturers of Lathes, Iron Planers, Drills and other machinists tools 50 6m*

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines, Saw and Grist Mill Irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch.
8 1y* LOGAN VAIL & CO., 9 Gold st., N. Y.

NORTHVILLE MACHINE WORKS—Manufactory of Machinists Tools, consisting of Engine Lathes, Power Planers, Hand Lathes, Engine Lathe for turning chair stuff, all of the most improved patterns and quality of workmanship. Worcester, Northville, Mass., August 1854. TAFT & GLEASON. 50 1y*

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Science and Art.

Annual of Scientific Discovery.

PAPER—The *Annual of Scientific Discovery for* 1855, edited by Prof. D. A. Wells, will soon be issued by Messrs. Gould & Lincoln, of Boston, and will contain a great variety of useful and scientific matter. From the proof sheets we copy the following extract of an article on paper making in the United States, a subject of very great importance at the present moment :—

The enormously increased consumption of rags and other materials used in the manufacture of paper, with the consequent increased scarcity of the raw material, and the enhancement of the price of paper, have caused much attention to be given to this subject, both in England and the United States, during the past season. Efforts have accordingly been made to introduce new materials to serve as paper stock, to improve the method of working old materials, and to diminish the cost of the mechanical operations. The cause of the scarcity of paper-stock, in spite of an increased demand, would appear to depend on the circumstance that the raw material of paper-making is, in reality, the product of the wear and tear of a substance of very advanced manufacture, and depending for its quantity on the collateral causes which produce a greater or less activity in the latter. Hence, the stoppage or partial suspension of cotton and other textile manufactures is sufficient to account for occasional, and especially for local, scarcity.

We find that there are, in the United States, 750 paper-mills in actual operation. Allowing 4 engines to each mill, and calculating that each engine will make 300 pounds of paper a day, the quantity of paper made in the year will be as follows :—

Number of mills, 750 ; number of engines, 3,000 ; number of pounds of paper per day, 900,000 ; number of pounds of paper in the year, allowing 300 days to the year, 270,000 000 ; value of this paper at 10 cents a pound, $27,000,000.

It is estimated that one and a-half pounds of rags are required to make one pound of paper. Adopting these data, we find that 405,000,000 pounds of rags are consumed in one year ; their value, at 4 cents a pound, being $16,200,000.

The cost of labor is 1¼ cents upon each pound of paper manufactured, and is, therefore, $3,375,000 a year ; and the cost of labor and rags united is $19,575,000 a year.

The cost of manufacturing, aside from rags and labor, estimated from adding together the cost of felts, wire-cloth, bleaching powders, fuel, machinery, interest, and fixed capital, insurance expenses, &c., we find to be $4,-050,000. Adding this to the cost of rags and labor, we find that $23,625,000 is the total cost of manufacturing paper worth $27,000,-000, a measure of profit by no means unreasonable, and which might even be considered small, were not the manufacture comparatively free from those sudden changes that affect the manufacture of cloth and metals.

Light as we may esteem it, there are few branches of business of more importance than the rag trade. No other country in the world, strange to say, is more dependent upon rags than the United States ; and this is, in a great measure, attributable to the immense consumption of paper in the publication of newspapers, magazines, and works of all kinds, besides what is used for commercial and mercantile purposes.

For the four years, 1850, '51, '52, '53, the quantity of rags imported into the United States amounted to 97,846,035 pounds, costing $3,262,000, or about 3⅓ cents per pound.

In 1850 we imported rags from nineteen countries ; in 1852 from thirty-two ; which increment seems to have arrived near the ultimate limit.

Italy seems to be the great source of supply. In 1850 we obtained nearly half as many pounds from there as from all other places, while the amount paid exceeded half the whole sum. In 1851, the quantity and price of Italian rags only exceeded one-third of the amount by a trifle.

In 1853, there were 304 paper-mills at work in England, 48 in Scotland, and 28 in Ireland. The duty (three half-pence per pound) amounted to upwards of £925,000, so that the annual value of paper manufactured in those countries could not be less than £3,700,000, the average value of paper being estimated at sixpence per pound.

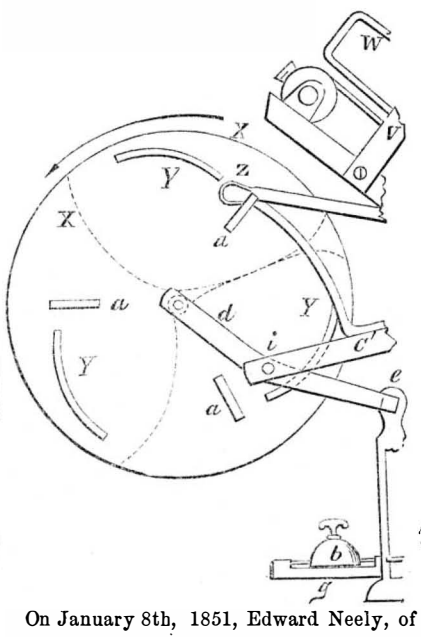
France, with a population of 36,000,000, turns annually into paper 105,000 tuns of rags. Of these 6,000 tuns are imported. In that country the exportation of rags has been prohibited by law since 1850.

England, with 28,000,000 inhabitants, requires yearly 90,000 tuns of rags, 15,000 of which are imported.

The consumption of paper in the United States is said to be equal to that of England and France added together. There are used here 6,000 tuns of straw for wrapping paper and paste boards, and during the last few years the importation of rags has averaged 10,000 tuns.

History of Reaping Machines.—No. 19.

FIG. 45.



On January 8th, 1851, Edward Neely, of Savannah, Ga., obtained a patent for a rotary reaper, embracing three claims relating to the suspending of the cutting ring, and the method of raising the cutter over obstructions, and guiding the machine : (see claim, page 142, Vol. 6, SCI. AM.) On the 5th of Feb. following a patent was obtained by Sidney S. Hurlbut of Racine, Wisconsin, embracing two claims, the object of the whole point of the-invention being embraced in a method of conveying the cut grain from the sickle, and weighing it in bunches of a uniform weight, then depositing them upon the ground, ready to be bound.

The annexed figure (45) being a front elevation of the weighing machinery. W is one (the top ene) of two movable rods to receive the grain as soon as it begins to ascend the inclined plane, and they press upon the grain until it arrives at the weigher ; *d* are levers whose fulcra are at *i*. The weigher is divided into three compartments, X. It may be made of light sheet iron. Upon the front end of the weigher are stops, *a*, and curved guides, Y. Z is a roller intended to relieve stop, *a*, from the catch, as soon as the weighter, X, has received, enough of grain to form a sheaf, and to cause it to gravitate below the end of the catch. The weigher being a broad cylindrical receiver, with the chambers, X, after it has descended until it is below the roller, *z*, immediately revolves one-third of its circumference, deposits a sheaf, and resumes its proper position by the weight, *b*, which preponderates, and it is again arrested by the next radial stop, *a*, coming in contact with the catch, whieh holds it in position until the next cell, X, below W, receives its proper quantity of cut grain to form a sheaf, when the weigher relieves itself as before, carrying down and depositing the succeeding bunch. It is thus a self-acting rotary bundling and weighing apparatus, combined with the cutting and conveying machiney. C' is one of two stationary arms, one is made fast to the front, and one to the rear end of the frame ; the ends of these act as fulcra for the levers, *d*. In the upper end of these levers the journal of the weigher revolves ; *i*, is a pin, on which these levers are hung at their middle, and their lower ends are let into the bar, *e*, which extends across the end of the frame, from the middle of which the forked rod descends, and is attached perpendicularly to the balance beam, *g*. This weigher, with its contents, can be regulated so as to make a sheaf of any desired size or weight by simply sliding the weight, *b*, in or out—nearer or further from the end of its lever. A ratchet and pawl are employed to make this rotating weigher always revolve in the direction of the arrow : (see claim on page 174, Vol. 6 SCI. AM.) On May the 20th following, W. Watson, E. S. Renwick, and P. H. Watson, of Washington, D. C., obtained a patent, the object of the inventors being to cut, rake, and bind the bunches by automatic movements. The patent embraces six claims : (see page 294, Vol. 6, SCI. AM.) On June 10th, same year, N. T. Allen, of Ludlowville, N. Y. obtained a patent for operating the gearing of the machine from both wheels to equalize the driving power upon each : (see claim, page 318, Vol. 6, SCI. AM.) On the 24th June, 1851, a patent was granted to Wm. Start, of Smyrna, Ill., for an improved harvester, which is illustrated by a perspective view on page 393. Vol. 6, SCI. AM. ; the claim will be found on page 334, same Vol.

The Bottom of the Ocean.

The bottom of the ocean is as unequal as the surface of the earth. Beneath the waters of the seas there are mountains, hills, and valleys. Some of these have bold and precipitous sides, while others swell gradually from base to summit. The average depth of the sea between England and France, in the Channel, is only 30 fathoms, and is uniform, as has been proven by laying down the telegraph cable. The bottom of the Mediterranean sea, on the other hand, is very deep, being no less than 250 fathoms, and in one place 350. In laying down a submarine telegraph cable last summer, between Piedmont and Corsica, Mr. Brett, the gentleman who constructed the line, came to a place where the cable flew off with a frightful velocity, and it was found that the depth suddenly varied from 100 to 350 fathoms. No map better explains the varying depth of the ocean, its hills and valleys, than the one on page 256, Vol. 9, SCIENTIFIC AMERICAN, which exhibits the deep sea soundings taken by American naval vessels. A very good idea of what the bottom of the sea is like may be obtained from the face of the dry land, as there is abundant proof of many parts of it being once the floor of the ocean. All Long Island was at one period covered with the sea, and the whole interior of New York State, and a number of our Western States, afford numerous evidences of having once been covered with water.

Intense Cold.

On the nights of the 6th and 7th inst, the weather was colder over a wide extent of our country than has been experienced for fifty years. In New York City the temperature was 6° below zero ; at Albany, N. Y., it was 20°, at Syracuse, N. Y., 20°, and 30° at Ogdensburg, N. Y. In some parts of Vermont and New Hampshire, the mercury was frozen, so that, according to an Irishman's opinion of the subject, "it couldn't have been any colder unless the glass had been made longer."

The cold was indeed intense, and the poor suffered dreadfully. This winter, in our large cities, has been more trying to the poor than any in the history of our country. So many are out of employment, and provisions are so dear, that the suffering is not only very wide spread but very severe. Well fed persons can endure more cold than those who are poorly fed ; now it so happens that fuel being so very dear, as well as provisions, that the sufferings of the poor have become doubly complicated and intensified. We hope for an early Spring, and better times.

A Small Earthquake.

A severe shock of an earthquake was felt throughout Maine and New Brunswick on the night of the 7th inst, the night of severest cold. The earth below seemingly was affected by the cold, as the atmosphere is during great heat. May there not be some relation between the phenomena.

The Minie Bullet in America.

We have been shown one of the Minie bullets which are now being extensively manufactured at C. Sharp's factory, at Hartford, Conn., to be used in his breach-loading rifles. We are told that they are the very things for his rifle, rendering it perfect in its action.

LITERARY NOTICES.

ENGINEER'S POCKET COMPANION FOR THE FIELD—This is a neat and very useful work, by Walter Griswold, of Buffalo, N. Y., and published by Miller, Orton, and Mulligan, of the same place ; it is a book composed of notes, which the author had been collecting for a long time. It contains a most instructive and most useful chapter on the "Art of Levelling," which is intended for new beginners. It is plain and clear, dispensing with terms that are liable to confuse the mind,—using only plain language. This little volume will no doubt meet with an extensive patronage.

THE WESTMINSTER REVIEW—No. 1 of Volume 40, of the above-named excellent Review, has just been issued by the enterprising American publishers, Leonard Scott & Co., No. 54 Gold street, this city. The leading article is on the Anglo French Alliance, and is both able and profound. The second article is on the Ballads of the People, and is a rich intellectual treat. An article on Poland—her history and prospects—should be read by every person who wishes to be intelligent regarding the present state of Europe. This is an excellent time to subscribe for this Review ; it is liberal in its opinions. The price is only $3 per annum.

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